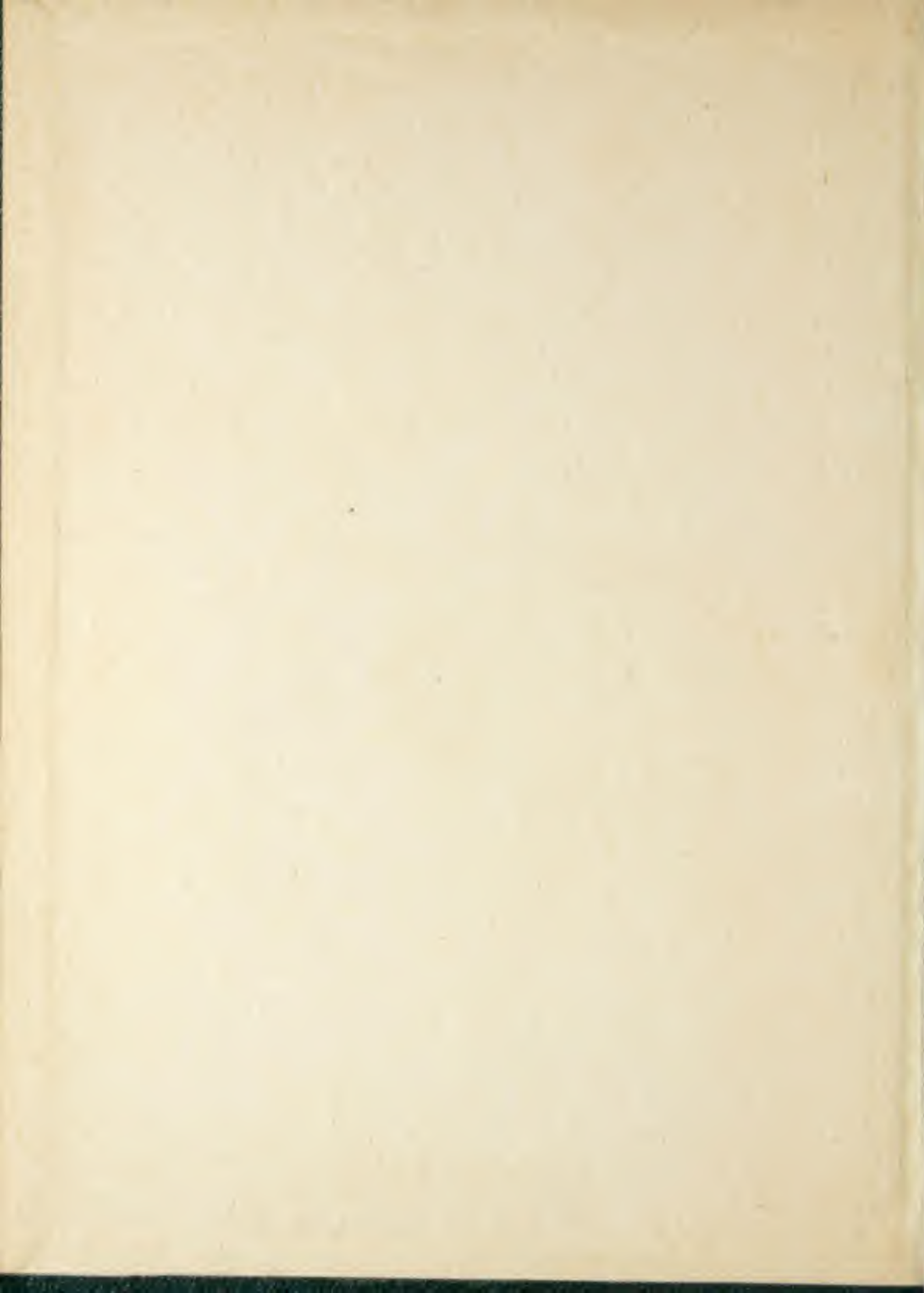
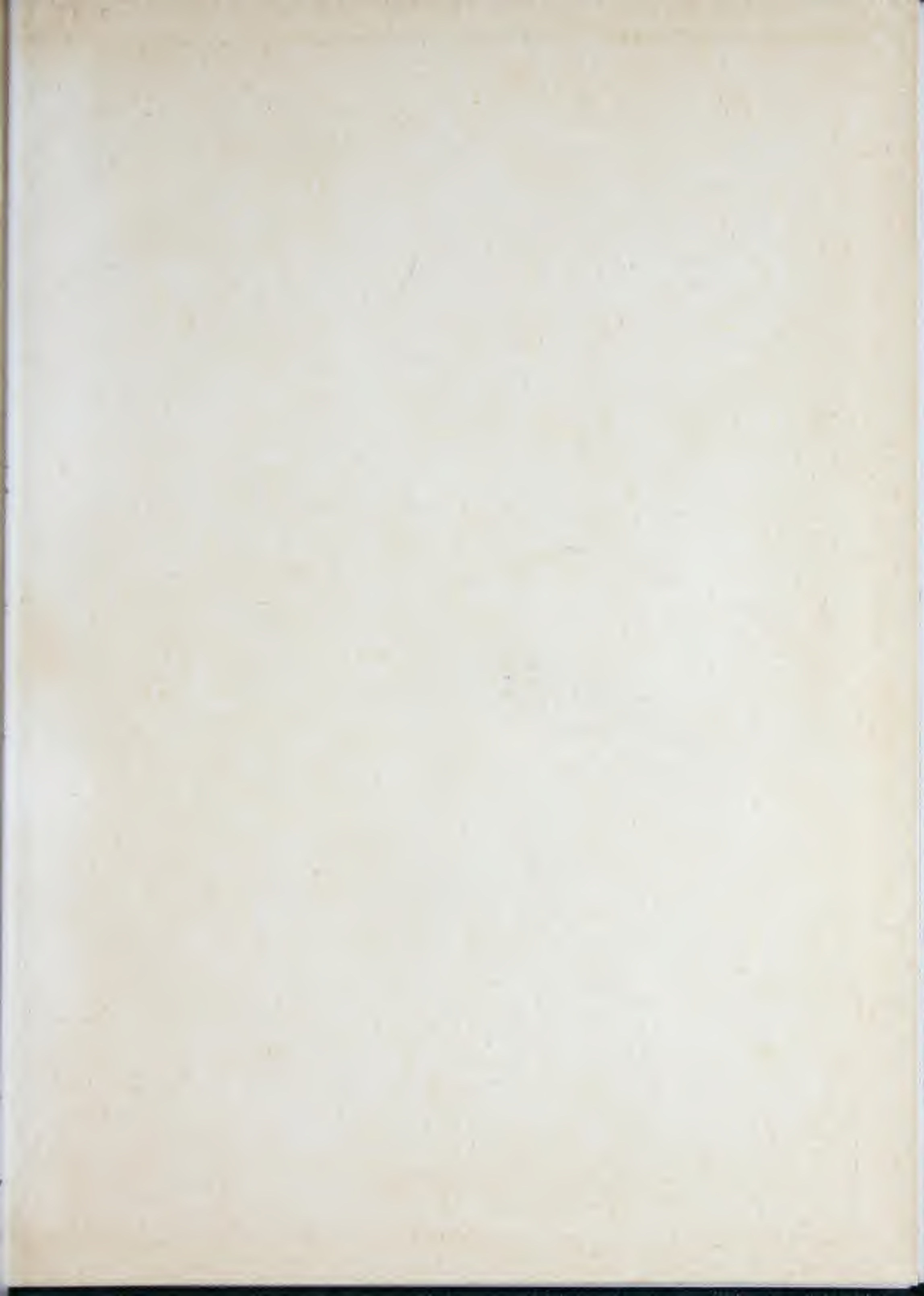


# DATA BOOK

IMPERIAL RADIATOR CO.  
LIMITED







# CATALOGUE No. 20

JUNE 1926

*See Guide for Estimating  
on pages 97 and 98.*

IMPERIAL RADIATOR CO. LIMITED

# **IMPERIAL RADIATOR COMPANY** **LIMITED**

## **Catalogue and Price List**

# **BOILERS**

- "New King" Hot Water Boilers
- "Royal" Round Steam Boilers
- "Royal" Square Sectional Boilers  
For Steam and Water
- "Royal" Smokeless Steam and Water Boilers
- "Royal" Firebox Steam and Water Boilers
- "Royal" Bungalow and Laundry Heaters

# **RADIATORS**

- "Imperial" and "King" Radiators  
For Water and Steam

## **STEAM and WATER FITTINGS** **IRON PIPE and VALVES**

**IMPERIAL RADIATOR COMPANY LIMITED**

Head Office and Works

**ST. CATHARINES, ONT.**

Sales Offices and Warehouses

**TORONTO - MONTREAL**

Agencies in the following Cities

WINNIPEG, MAN  
SASKATOON, SASK.  
NEWFOUNDLAND

CALGARY, ALTA.  
VANCOUVER, B.C.  
HAMILTON, ONT.

HALIFAX, N.S.  
QUEBEC, P.Q.  
OTTAWA, ONT.

Catalogue No. 20

January, 1926

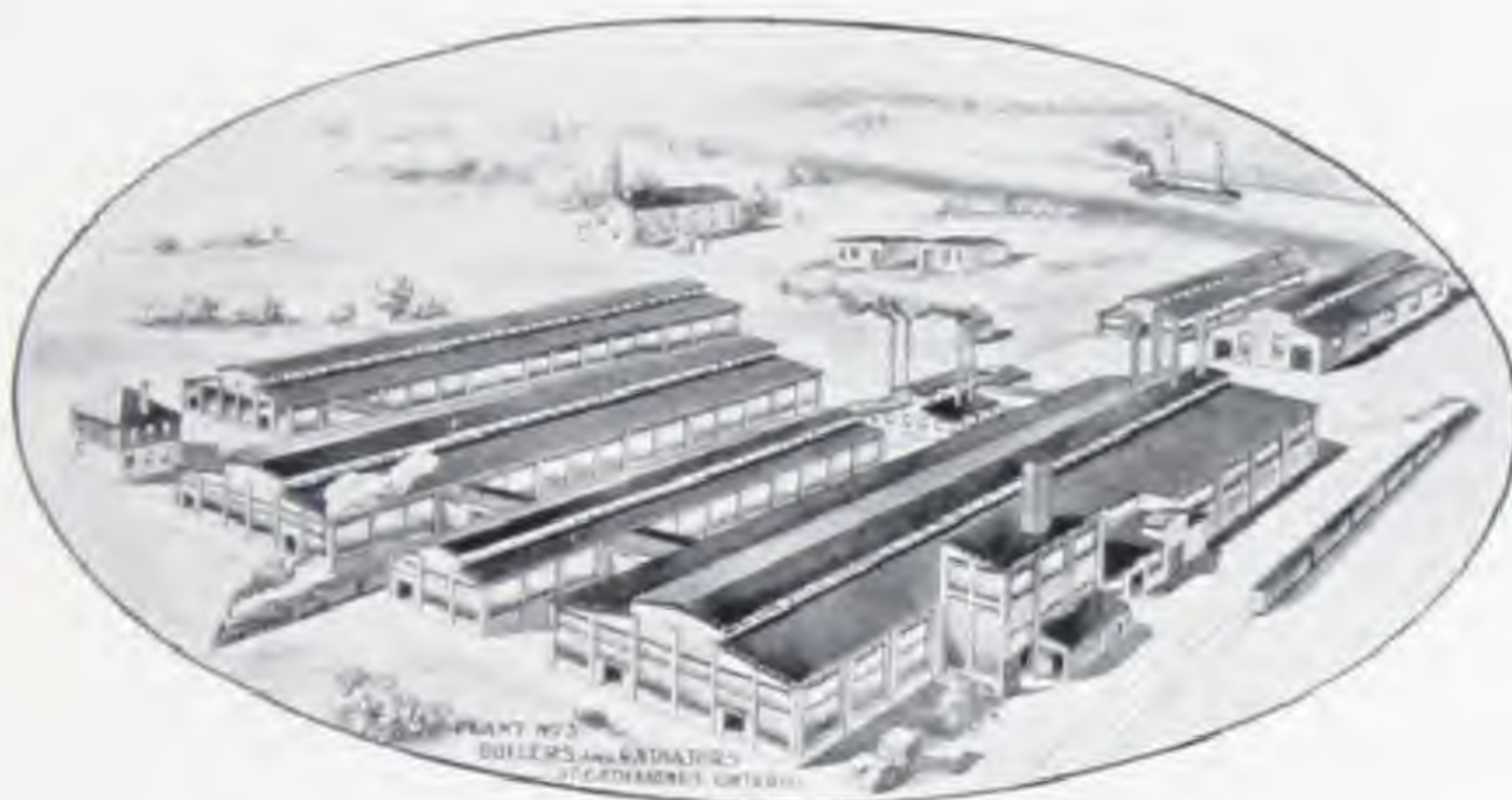
NEW KING AND ROYAL BOILERS

AND

IMPERIAL RADIATORS

FOR

HOT WATER AND STEAM HEATING



VIEW OF MODERN

BOILER AND RADIATOR PLANT

OF

IMPERIAL RADIATOR COMPANY, LIMITED

ST. CATHARINES

- -

ONT.

## *To The Trade,--*

In this edition of our Hand Book we have endeavoured to present as fully as possible our complete line of Boilers and Radiators, also Fittings and Specialties, etc.

NEW KING and ROYAL Boilers and IMPERIAL Radiators are Made in Canada in our large and up-to-date Boiler and Radiator Plant at St. Catharines, Ont.

Our Products are made of only the best grades of iron, under the most careful supervision, and carry our unqualified guarantee to give absolute satisfaction.

We solicit your valued patronage which shall receive our most careful and expert attention, and invite your closest inspection of our products which can be seen at our show rooms.

Sincerely yours,

IMPERIAL RADIATOR COMPANY  
LIMITED

## CONDITIONS OF SALE

### 1. GUARANTEE—

Our goods are guaranteed to the extent of furnishing new parts to replace those that may prove defective in manufacture. No claim will be allowed unless made within sixty days. Labor and other charges will not be allowed.

### 2. SHIPMENTS—

(a) All goods are shipped at buyer's risk, and should be carefully examined before receipt for same is given to the Transportation Company. If the Transportation Company tenders delivery of goods in bad order, buyer should insist on the Agent making notation of such condition on the freight bills before accepting, thus enabling him to secure prompt payment of claims, which should be filed by him against carriers for the value of the damaged material. The responsibility of Imperial Radiator Company, Limited, ceases upon delivery of goods in good order to the Transportation Company.

(b) All orders are accepted subject to strikes, accidents, transportation delays, shortage of delivery of raw materials or other causes beyond our control.

### 3. RETURNS—

Goods must not be returned except by special permission.

**IMPERIAL RADIATOR COMPANY, LIMITED**

June, 1926

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## NEW KING HOT WATER BOILERS

No. 5 Low Base  
NEW KING  
BOILER

Push Nipple Con-  
struction



## NEW KING HOT WATER BOILERS

No. 6 Low Base  
Showing top outlets  
and side inlets.



# NEW KING HOT WATER BOILER

Size	Net Rating in Sq. Ft. Direct Radiat'n			List Prices Low Base	List Prices High Base	Height to Bottom of Smoke Collar Low Base Inches	Diameter in Inches of				Depth of Fire Pot	Average Fire Pot Area Sq. Ft.	Average Area Grate Sq. Ft.
	Gross Rating in Sq. Ft. Direct Radiat'n	Net Rad'g in Linear Feet 1 In. Pipe	Smoke Pipe				Base Ring	Fire Pot Top	Fire Pot Bottom				
2-C	250	375	750	\$268.00	\$302.00	43½	8	26½	17½	19	16½	1.82	1.97
2	365	550	1095	320.00	360.00	47½	8	26½	17½	19	16½	1.82	1.97
2½	420	625	1260	356.00	395.00	51½	8	26½	17½	19	16½	1.82	1.97
3-C	420	625	1260	356.00	395.00	43½	8	30	19½	21½	16½	2.23	2.46
3	500	750	1500	382.00	425.00	46½	8	30	19½	21½	16½	2.23	2.46
3½	585	875	1755	425.00	465.00	50½	8	30	19½	21½	16½	2.23	2.46
4-C	585	875	1755	425.00	465.00	43½	8	31	22½	24	17½	2.95	3.14
4	685	1025	2055	462.00	505.00	47½	8	31	22½	24	17½	2.95	3.14
4½	750	1125	2250	498.00	545.00	51½	8	31	22½	24	17½	2.95	3.14
5-C	750	1125	2250	498.00	545.00	46½	10	35	24½	26	18½	3.48	3.69
5	835	1250	2505	550.00	603.00	50½	10	35	24½	26	18½	3.48	3.69
5½	935	1400	2805	590.00	651.00	54½	10	35	24½	26	18½	3.48	3.69
6-C	935	1400	2805	590.00	651.00	46½	10	37½	27	28½	18½	4.20	4.43
6	1000	1500	3000	654.00	700.00	50½	10	37½	27	28½	18½	4.20	4.43
6-A	1100	1650	3300	706.00	746.00	54½	10	37½	27	28½	18½	4.20	4.43
6½-C	1100	1650	3300	706.00	746.00	53½	12	40	29½	31	19½	5.00	5.24
6½	1250	1875	3750	775.00	842.00	58½	12	40	29½	31	19½	5.00	5.24
6½-A	1350	2025	4050	840.00	905.00	63½	12	40	29½	31	19½	5.00	5.24
7-C	1350	2025	4050	840.00	905.00	52½	12	42½	32	33½	19½	5.85	6.12
7	1500	2250	4500	880.00	950.00	57½	12	42½	32	33½	19½	5.85	6.12
7½	1765	2650	5295	945.00	1017.00	62½	12	42½	32	33½	19½	5.85	6.12
8-C	1765	2650	5295	945.00	1017.00	55½	12	46½	36½	38½	19½	7.67	7.98
8	2000	3000	6000	1052.00	1160.00	61½	12	46½	36½	38½	19½	7.67	7.98
8½	2300	3450	6900	1210.00	1326.00	66½	12	46½	36½	38½	19½	7.67	7.98
*9-C	2300	3450	6900	1210.00	1326.00	56½	12	49½	39½	40½	19½	8.73	9.06
*9	2665	4000	7995	1300.00	1396.00	61½	12	49½	39½	40½	19½	8.73	9.06
*9½	3000	4500	9000	1500.00	1600.00	67	12	49½	39½	40½	19½	8.73	9.06

NOTE.—"NEW KING" Boilers will carry the ratings shown above and mains in addition. No extra charge for Special Headers. All half sizes have five sections above fire pot. All C Sizes have three sections above fire pot. Arranged for Pipe Coil at either side of heater for water for Domestic purposes. For additional measurements see "Roughing-in Section," Pages 33 to 37.

\*Sizes No. 8C, 9, 9½ are only made in "King" Water Post Pattern.

NOTE.—For High Base Boilers add to above measurements as follows: No. 2—6½" No. 3—6½" No. 4—6½" No. 5—7½" No. 6—6½" No. 6½—5½" No. 7—6½" No. 8—6½" No. 9—6½".

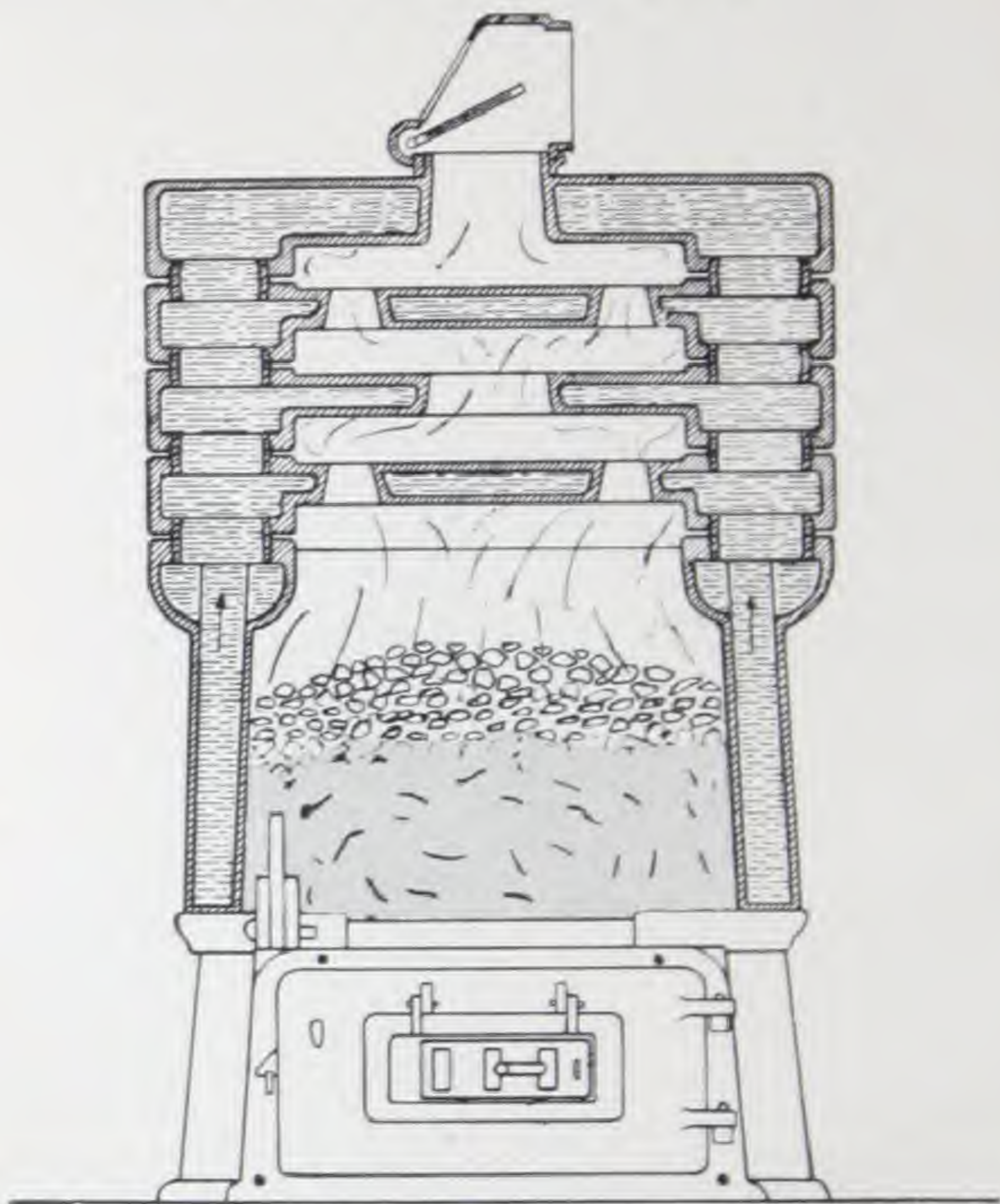
# IMPERIAL RADIATOR COMPANY LIMITED

## NEW KING HOT WATER BOILER NUMBER AND SIZE OF FLOW AND RETURN OPENINGS

Size	Top Outlet and Side Inlet Boiler		Western Header Openings		Branch Header Openings		Comparative Boiler Sizes
	No. and Size Flow Openings	No. and Size Return Openings	No. and Size Flow Openings	No. and Size Return Openings	No. and Size Flow Openings	No. and Size Return Openings	
2-C	2-2 1/2"	2-2 1/2"	2-2 1/2"	2-2 1/2"	4-2"	4-2"	3-19-W
2	2-2 1/2"	2-2 1/2"	2-2 1/2"	2-2 1/2"	4-2"	4-2"	4-19-W
2 1/2	2-2 1/2"	2-2 1/2"	2-2 1/2"	2-2 1/2"	4-2"	4-2"	5-19-W
3C	2-3"	2-3"	2-2 1/2"	2-2 1/2"	4-2"	4-2"	3-22-W
3	2-3"	2-3"	2-2 1/2"	2-2 1/2"	4-2"	4-2"	4-22-W
3 1/2	2-3"	2-3"	2-2 1/2"	2-2 1/2"	4-2"	4-2"	5-22-W
4-C	2-3"	2-3"	2-2 1/2"	2-2 1/2"	4-2"	4-2"	3-25-W
4	2-3"	2-3"	2-2 1/2"	2-2 1/2"	4-2"	4-2"	4-25-W
4 1/2	2-3"	2-3"	2-2 1/2"	2-2 1/2"	4-2"	4-2"	5-25-W
5-C	2-4"	2-4"	2-2 1/2"	2-2 1/2"	7-2"	7-2"	3-26-W
5	2-4"	2-4"	2-2 1/2"	2-2 1/2"	7-2"	7-2"	4-26-W
5 1/2	2-4"	2-4"	2-2 1/2"	2-2 1/2"	7-2"	7-2"	5-26-W
6C	2-4"	2-4"	2-2 1/2"	2-2 1/2"	7-2"	7-2"	3-28-W
6	2-4"	2-4"	2-2 1/2"	2-2 1/2"	7-2"	7-2"	4-28-W
6-A	2-4"	2-4"	2-2 1/2"	2-2 1/2"	7-2"	7-2"	5-28-W
6 1/2-C	2-5"	2-5"	4-3"	4-3"	8-2"	8-2"	3-31-W
6 1/2	2-5"	2-5"	4-3"	4-3"	8-2"	8-2"	4-31-W
6 1/2-A	2-5"	2-5"	4-3"	4-3"	8-2"	8-2"	5-31-W
7-C	2-5"	2-5"	4-3"	4-3"	11-2"	11-2"	3-34-W
7	2-5"	2-5"	4-3"	4-3"	11-2"	11-2"	4-34-W
7 1/2	2-5"	2-5"	4-3"	4-3"	11-2"	11-2"	5-34-W
8-C	2-5"	2-5"	2-3"	2-3"	13-2"	13-2"	3-38-W
8	2-5"	2-5"	2-4"	2-4"	13-2"	13-2"	4-38-W
8 1/2	2-5"	2-5"	2-3"	2-3"	13-2"	13-2"	5-38-W
9-C	2-5"	2-5"	2-3"	2-3"	13-2"	13-2"	3-41-W
9	2-5"	2-5"	2-4"	2-4"	13-2"	13-2"	4-41-W
9 1/2	2-5"	2-5"	2-3"	2-3"	13-2"	13-2"	5-41-W

Western Headers are Standard, and unless otherwise specified Boilers requiring Headers will be shipped accordingly.

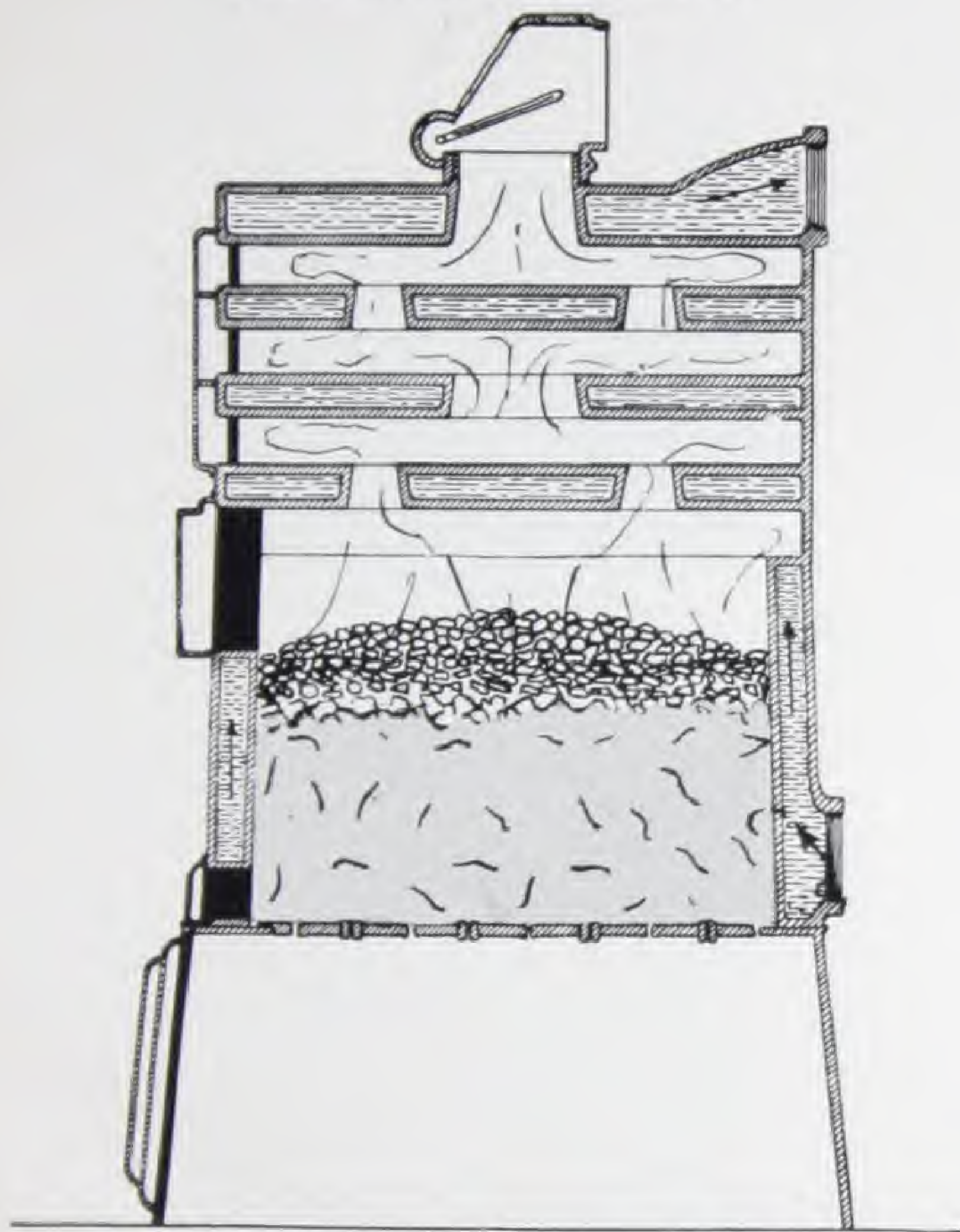
NEW KING  
HOT WATER BOILERS  
PUSH NIPPLE CONSTRUCTION



SECTIONAL VIEW

Showing Two Side Nipple Construction and Waterways, Combustion Chamber  
and Fire Travel

**NEW KING**  
**HOT WATER BOILERS**  
**PUSH NIPPLE CONSTRUCTION**



**SECTIONAL VIEW**

**Front to Back**

Showing Heating Surface, Fire Travel and Combustion Chamber.

NEW KING  
HOT WATER BOILERS



Base—Showing Grates and Shaking Mechanism  
Single Shaker



Base—Showing Grates and Double Shaker

**NEW KING  
HOT WATER BOILERS**



**NEW KING FIREPOT—BACK INLET**

Showing wide corrugation and two side push nipple connections.



**NEW KING FIRE POT--SIDE INLET**

Showing Return Inlet on side of Firepot.



NEW KING SECOND SECTION

NEW KING  
HOT WATER BOILERS



NEW KING FIRST  
SECTION

Showing distribution of flue  
openings.

DOMESTIC  
HEATERS



Price List

Sizes	Size Connection	List Price
No. 1-2-3	$\frac{3}{4}$ "	3.50
No. 4-5-6	$\frac{3}{4}$ "	4.25
No. 6 $\frac{1}{2}$ -7-8-9	1"	5.50

NOTE—Smaller size Heaters will fit larger Boilers.

## ROYAL WATER AND LAUNDRY HEATERS



NO. 0 ROYAL WATER  
HEATER



NO. 10 ROYAL WATER  
HEATER



NO. 112 ROYAL WATER  
HEATER

ROYAL BUNGALOW HEATERS



No. 118



No. 115

**ROYAL  
BUNGALOW HEATERS**

**PRICES, DIMENSIONS AND CAPACITIES**

No.	List Price	Capacity Gallons	Approximate Gross Capacity Square Feet	Net Capacity Square Feet	Nominal Diameter Grate, Inches	Grate Area, Square Feet	Outlets and Inlets, Inches	Comparative Heater Sizes
0	\$45.00	50	75	50	10	\$0.54	1-1½	T. 00
10	63.00	90	110	75	10	.54	1-1½	T. 0
12	120.00	190	225	150	12	.80	1-2½	T. 10
112	143.00	210	250	200	12	.80	1-2½	T. 12
* 15	164.00	380	450	325	15	1.23	1-3	T. 20
*115	203.00	425	495	400	15	1.23	1-3	T. 22
* 18	210.00	450	525	460	18	1.77	3-2	T. 30
*118	249.00	525	600	510	18	1.77	3-2	T. 32

NOTE:—\*These sizes equipped with Complete Set Firing Tools.

**ROYAL  
LAUNDRY HEATERS**

**PRICES, DIMENSIONS AND CAPACITIES**

No.	List Price	Capacity Gallons	Approximate Gross Capacity Square Feet	Nominal Diameter Grate, Inches	Grate Area Square Feet	Outlets and Inlets, Inches
1	\$63.00	100	120	10	45	1-1¼

NOTE:—For additional measurements see "Roughing In Section," Page 38.

ROYAL  
ROUND STEAM BOILERS



No. 4-25-S Round Steam Boiler, Low Base

# ROYAL

## ROUND STEAM BOILERS

### LISTS, DIMENSIONS AND CAPACITIES

Sizes of Boilers	Gross Rating in Sq. Ft. Direct Radiation	List Prices	Height to Top of Domes, Inches	Height of Water Line, Inches	Diameter in Inches of				Depth of Fire Pot	Average Fire Pot Area Sq. Ft.	Average Grate Area Sq. Ft.	No. and Size of Conne'ns		Sizes of Boilers
					Pipe	Base Ring	Fire Pot Top	Fire Pot Bottom				Outlets	Inlets	
3-19-S	300	\$205.00	50	41 1/2	8	26 1/2	17 1/2	19	16 3/4	1.82	1.97	1-2 1/2	1-2 1/2	3-19-S
4-19-S	350	215.00	54	45 1/2	8	26 1/2	17 1/2	19	16 3/4	1.82	1.97	1-2 1/2	1-2 1/2	4-19-S
5-19-S	400	235.00	58	49 1/2	8	26 1/2	17 1/2	19	16 3/4	1.82	1.97	1-2 1/2	1-2 1/2	5-19-S
3-22-S	450	255.00	51	40 1/2	9	30	19 3/4	21 1/4	16 3/4	2.23	2.46	1-3	1-3	3-22-S
4-22-S	525	295.00	55	44 1/2	9	30	19 3/4	21 1/4	16 3/4	2.23	2.46	1-3	1-3	4-22-S
5-22-S	575	312.50	59	48 1/2	9	30	19 3/4	21 1/4	16 3/4	2.23	2.46	1-3	1-3	5-22-S
3-25-S	550	295.00	51	41 1/2	9	31	22 1/2	24	17 1/4	2.95	3.14	1-3 1/2	1-3 1/2	3-25-S
4-25-S	625	325.00	55	45 1/2	9	31	22 1/2	24	17 1/4	2.95	3.14	1-3 1/2	1-3 1/2	4-25-S
5-25-S	700	337.50	59	49 1/2	9	31	22 1/2	24	17 1/4	2.95	3.14	1-3 1/2	1-3 1/2	5-25-S
3-28-S	800	375.00	56 1/4	44 1/2	10	37 1/2	27	28 1/2	18 3/4	4.20	4.43	1-4	1-4	3-28-S
4-28-S	900	400.00	61 1/4	48 1/2	10	37 1/2	27	28 1/2	18 3/4	4.20	4.43	1-4	1-4	4-28-S
5-28-S	1000	425.00	65 3/4	52 1/2	10	37 1/2	27	28 1/2	18 3/4	4.20	4.43	1-4	1-4	5-28-S
3-31-S	1100	450.00	57 1/4	44 1/2	10	40	29 1/2	31	19 1/2	5.00	5.24	1-5	1-5	3-31-S
4-31-S	1275	500.00	62 1/4	48 1/2	10	40	29 1/2	31	19 1/2	5.00	5.24	1-5	1-5	4-31-S
5-31-S	1400	525.00	66 3/4	52 1/2	10	40	29 1/2	31	19 1/2	5.00	5.24	1-5	1-5	5-31-S
3-34-S	1300	500.00	64 1/2	51 1/4	11	42 1/2	32	33 1/2	19 1/2	5.85	6.12	1-5	1-5	3-34-S
4-34-S	1500	550.00	69 1/4	56	11	42 1/2	32	33 1/2	19 1/2	5.85	6.12	1-5	1-5	4-34-S
5-34-S	1650	587.50	74	60 3/4	11	42 1/2	32	33 1/2	19 1/2	5.85	6.12	1-5	1-5	5-34-S

NOTE:—The Ratings given provide that all piping, in addition to the direct Radiation to be used, shall be figured as Radiating Surface in estimating the size of Boiler required. When soft coal is used for fuel, one size larger boiler is required than when hard coal is used. For additional measurements see "Roughing-in Section," Page 39.

ROYAL  
SQUARE SECTIONAL BOILERS



No. S-36-8 Steam Boiler

For Tappings and other Measurements, see page 41 and 42.

# ROYAL SQUARE SECTIONAL BOILERS STEAM

## PRICES, DIMENSIONS AND CAPACITIES

Size	Gross Rating Square Feet Radiation	List Price	Grate Area Square Feet	Average Fire Pot Area Square Feet	Regular Tap- pings Inches		Size Foundation Inches	Height to Top of Outlet, Inches	Total Width Inches	Total Length Inches	Height to Water Line, Inches	Smoke Pipe	Shipping Weights
					Supply, Inches	Return, Inches							
S-19-5	600	\$312.50	3.37	4.78	2-3	2-3	21½x29	52	32½	29¾	43¼	10	2,025
S-19-6	750	350.00	4.19	5.95	2-3	2-3	21½x36	52	32½	36	43¼	10	2,365
S-19-7	900	400.00	5.02	7.12	2-3	2-3	21½x42	52	32½	42¼	43¼	10	2,705
S-25-5	1,100	450.00	4.95	6.13	2-4	2-4	28 x33	57¼	36½	33	47¼	12	2,625
S-25-6	1,350	512.50	6.16	7.64	2-4	2-4	28 x40	57¼	36½	40	47¼	12	3,075
S-25-7	1,600	575.00	7.38	9.15	2-4	2-4	28 x47	57¼	36½	47	47¼	12	3,525
S-25-8	1,850	637.50	8.60	10.65	2-4	2-4	28 x54	57¼	36½	54	47¼	12	3,975
S-36-5	2,100	700.00	9.38	11.77	2-5	2-5	41½x30	70	56	43½	57½	16	4,740
S-36-6	2,650	837.50	11.50	14.69	2-5	2-5	41½x47½	70	56	52	57½	16	5,560
S-36-7	3,150	962.00	13.75	17.61	3-5	2-5	41½x56	70	56	60½	57½	16	6,380
S-36-8	3,700	1,100.00	16.00	20.54	3-5	2-5	41½x64½	70	56	69	57½	16	7,200
S-36-9	4,200	1,225.00	18.25	23.46	3-5	2-5	41½x73	70	56	77½	57½	16	8,020
S-36-10	4,725	1,362.50	20.50	26.38	4-5	2-5	41½x81½	70	56	86	57½	16	8,820
S-36-11	5,250	1,487.50	22.75	29.30	4-5	2-5	41½x90	70	56	94½	57½	16	9,620
S-36-12	5,775	1,625.00	25.00	32.22	4-5	2-5	41½x98½	70	56	103	57½	16	10,042
S-36-13	6,300	1,750.00	27.25	35.14	4-5	2-5	41½x107	70	56	111½	57½	16	11,220
S-48-6	5,275	1,500.00	17.84	22.38	2-6	2-4	54 x59½	80	67	64½	68	20	9,090
S-48-7	6,300	1,750.00	21.33	26.76	3-6	2-4	54 x70	80	67	75	68	20	10,530
S-48-8	7,325	2,012.50	24.84	31.17	3-6	2-4	54 x80½	80	67	85½	68	20	11,970
S-48-9	8,350	2,262.50	28.33	38.55	3-6	2-4	54 x91	80	67	96	68	20	13,410
S-48-10	9,375	2,525.00	31.83	39.94	3-6	2-4	54x101½	80	67	106½	68	20	14,850

X Add to Length to allow for Smoke Hood as follows:—15 and 19 Series, 12 inches—25 and 36 Series, 14 inches—48 Series, 20 inches. 48 Series sections are in halves.

NOTE:—The ratings given provide that all piping in addition to the direct radiation to be used, shall be figured as radiating surface in estimating size of boiler required.

NOTE:—For direct indirect radiation add 30 per cent. For indirect radiation add 60 per cent.

When soft coal is used for fuel, one size larger boiler is required than when hard coal is used.

Arranged for pipe coil for heating water for domestic purposes.

ROYAL  
SQUARE SECTIONAL BOILERS



No. 16-A BOILER

Sectional View

Showing Fire-Tried and Water Ways

# IMPERIAL RADIATOR COMPANY LIMITED

## ROYAL SQUARE SECTIONAL BOILERS—WATER PRICES, DIMENSIONS AND CAPACITIES

Size	Gross Rating Square Feet Radiation	List Price	Grate Area Square Feet	Average Fire Pot Area Square Feet	Regular Tap- pings Inches		Size Foundation Inches	Height to Top Of Outlet, Inches	Total Width Inches	Total Length Inches	Smoke Pipe	Shipping Weight
					Supply Inches	Return Inches						
W-19-5	1,000	\$287.50	3.37	4.78	2-3	2-3	21½x29½	52	32½	29¾	10	1,965
W-19-6	1,250	325.00	4.19	5.95	2-3	2-3	21½x36	52	32½	36	10	2,305
W-19-7	1,500	375.00	5.02	7.12	2-3	2-3	21½x42	52	32½	42¼	10	2,645
W-25-5	1,850	425.00	4.95	6.13	2-4	2-4	28 x33	57¼	36½	33	12	2,550
W-25-6	2,250	487.50	6.16	7.64	2-4	2-4	28 x40	57¼	36½	40	12	3,000
W-25-7	2,650	550.00	7.38	9.15	2-4	2-4	28 x47	57¼	36½	47	12	3,450
W-25-8	3,050	612.50	8.60	10.65	2-4	2-4	28 x54	57¼	36½	54	12	3,900
W-36-5	3,450	675.00	9.38	11.77	2-5	2-5	41½x39	70	56	43½	16	4,380
W-36-6	4,350	800.00	11.50	14.69	2-5	2-5	41½x47½	70	56	52	16	5,080
W-36-7	5,200	925.00	13.75	17.61	3-5	4-5	41½x56	70	56	60½	16	5,780
W-36-8	6,050	1,062.50	16.00	20.54	3-5	4-5	41½x64½	70	56	69	16	6,480
W-36-9	6,950	1,187.50	18.25	23.46	4-5	4-5	41½x73	70	56	77½	16	7,180
W-36-10	7,825	1,300.00	20.50	26.38	5-5	5-5	41½x81½	70	56	86	16	7,880
W-36-11	8,700	1,425.00	22.75	29.30	5-5	5-5	41½x90	70	56	94½	16	8,580
W-36-12	9,575	1,562.50	25.00	32.22	5-5	5-5	41½x98½	70	56	103	16	9,280
W-36-13	10,450	1,687.50	27.25	35.14	5-5	5-5	41½x107	70	56	111½	16	9,980
W-48-6	8,700	1,437.50	17.84	22.38	2-6	2-6	54 x59½	80	67	64½	20	8,850
W-48-7	10,375	1,687.50	21.33	26.76	2-6	2-6	54 70	80	67	75	20	10,250
W-48-8	12,050	1,950.00	24.84	31.17	3-6	3-6	54 x80½	80	67	85½	20	11,650
W-48-9	13,725	2,200.00	28.33	35.55	3-6	3-6	54 x91	80	67	96	20	13,050
W-48-10	15,400	2,462.50	31.83	39.94	3-6	3-6	54x101½	80	67	106½	20	14,450

X Add to length to allow for Smoke Hood as follows:—15 and 19 Series, 12 inches—25 and 36 Series, 14 inches—48 Series, 20 inches. 48 Series sections are in halves.

NOTE:—The ratings given provide that all piping in addition to the direct radiation to be used, shall be figured as radiating surface in estimating size of boiler required.

NOTE:—For direct indirect radiation add 30 per cent. For indirect radiation add 60 per cent.

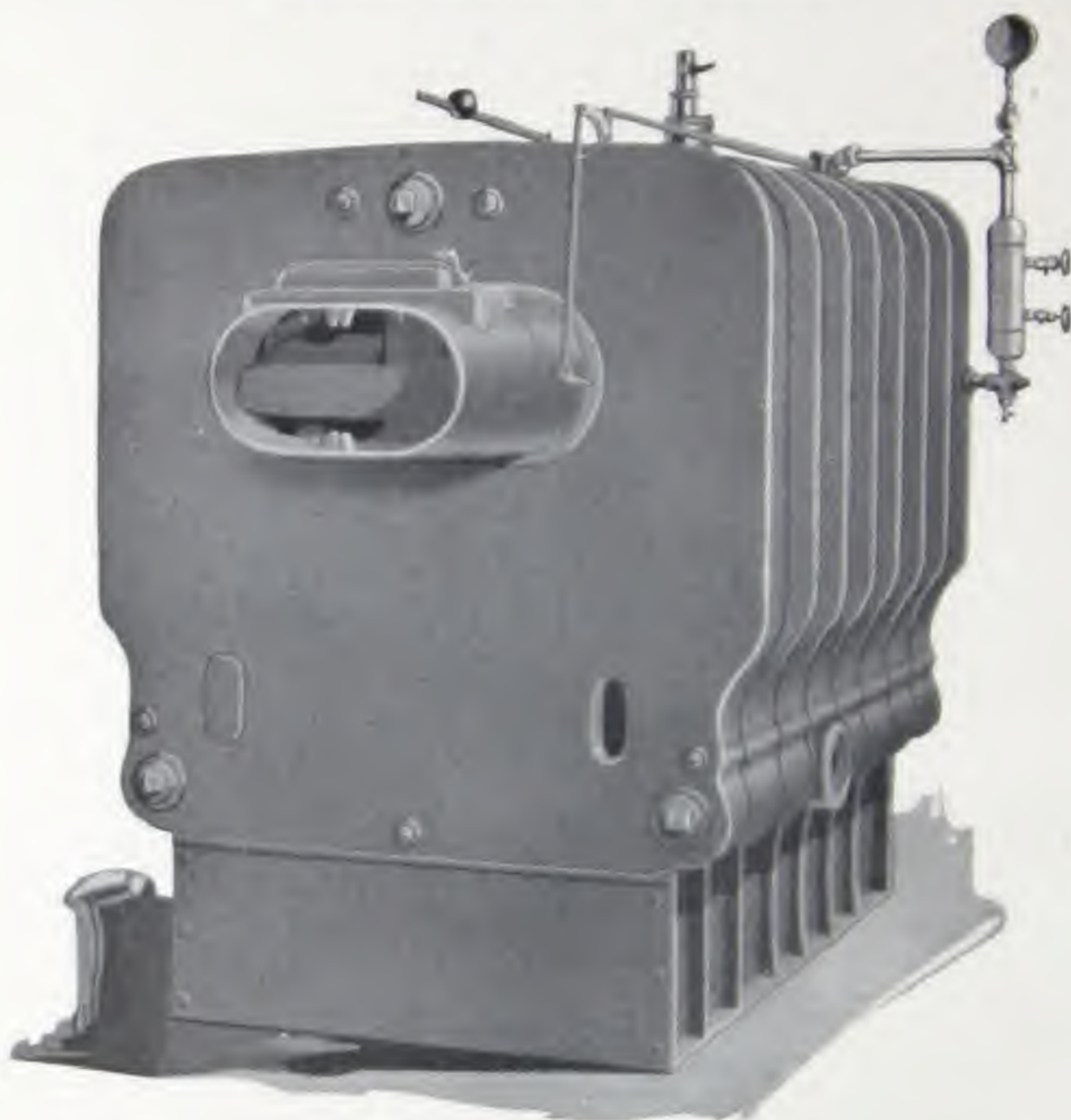
When soft coal is used for fuel, one size large boiler is required than when hard coal is used.

Arranged for pipe coil for heating water for domestic purposes.

NOTE:—For tappings and their location see "Roughing-in Section" page 42.

For measurements see "Roughing-in Section" page 41.

ROYAL  
SQUARE SECTIONAL BOILERS



36" Rear View showing smoke hood and domestic heater openings.  
For Measurements, see page 41. For Tappings and Location, see page 42.

**ROYAL**  
**SQUARE SECTIONAL BOILERS**



Heavy Trussed Grate Bar in Royal Boilers.

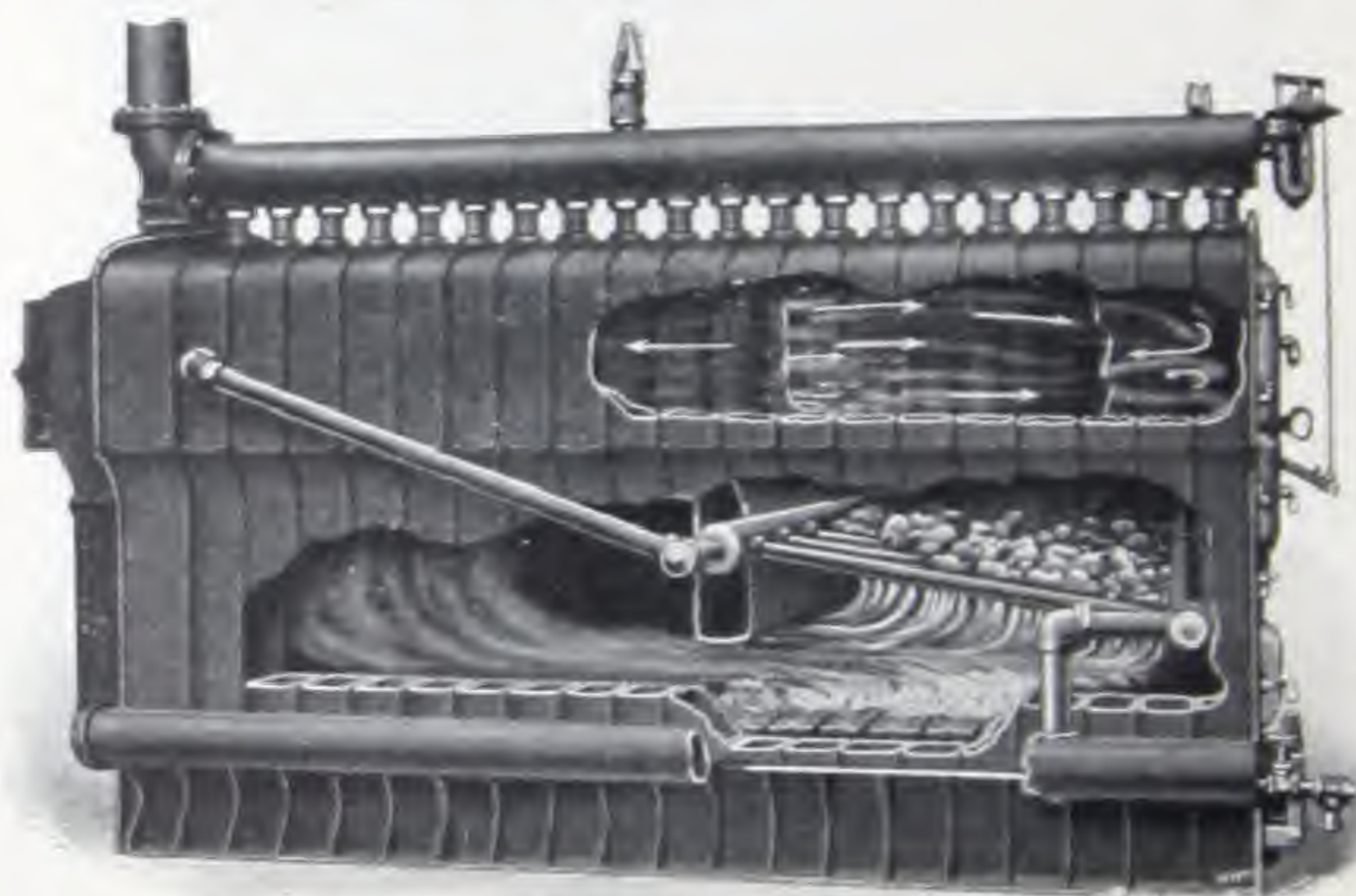


Ashpit of Royal Square Boiler showing Double Shaker,  
Grate Stop and Rocking Grates in position.



**ROYAL**  
**SMOKELESS**  
**STEAM AND**  
**WATER BOILERS**

No. 320 Royal Smokeless  
Steam Boiler.



"Sectional view" showing Water Tube Grate, Down Draft and Fire Travel.  
For Measurements see Roughing-in section page 43.

# ROYAL SMOKELESS STEAM BOILERS WITH DOWN DRAFT GRATE

## PRICES, DIMENSIONS AND CAPACITIES

Size of Boiler	Rating Square Feet	List Price \$ cts.	Grate Surface Square Feet	Heating Surface Square Feet	No. and Size of Steam Connections	No. and Size of Return Connect'ns	Height of Water Line	Height of Boiler	Length of Boiler	Width of Boiler	Size of Smoke Pipe	Chimneys and Flues Recommended		No. of Sections
												Round In. Ft.	Square In. Ft.	
S-338	4800	938.00	14.23	179	1-5	2-3	63	90	65	60	18	16x 50	16x 50	8
S-339	5400	1006.00	17	200	1-5	2-3	63	90	71	60	18	20x 50	20x 60	9
S-340	6000	1074.00	19.65	220	1-5	2-3	63	90	77	60	18	20x 60	20x 60	10
S-341	6600	1124.00	22	240	1-6	2-4	63	90	84	60	18	20x 60	20x 65	11
S-342	7200	1218.00	22	262	1-6	2-4	63	90	90	60	18	20x 60	20x 65	12
S-343	7800	1296.00	25.1	283	1-6	2-4	63	90	96	60	18	20x 60	20x 75	13
S-344	8600	1345.00	25.1	316	1-6	2-4	63	90	102	60	18	20x 60	20x 75	14
S-345	9200	1448.00	28	337	1-6	2-4	63	90	109	60	21	24x 60	24x 65	15
S-346	10000	1495.00	28	360	1-6	2-4	63	90	115	60	21	24x 65	24x 70	16
S-347	11000	1568.00	28	378	1-6	2-4	63	90	121	60	21	24x 65	24x 70	17
S-409	9000	1560.00	24	324	1-8	2-5	68	99	93	72	21	24x 60	24x 65	9
S-410	10000	1637.00	27	359	1-8	2-5	68	99	100	72	21	24x 60	24x 65	10
S-411	11000	1756.00	31.66	394	1-8	2-5	68	99	108	72	21	24x 65	24x 70	11
S-412	12000	1842.00	31.66	427	1-8	2-5	68	99	114	72	21	24x 70	24x 75	12
S-413	13000	1953.00	31.66	461	1-8	2-5	68	99	121	72	21	24x 75	24x 80	13
S-414	14000	2020.00	35.50	496	1-8	2-5	68	99	129	72	24	24x 80	24x 85	14
S-415	15000	2150.00	35.50	531	1-8	2-5	68	99	136	72	24	24x 85	24x 90	15
S-416	16000	2325.00	35.50	565	1-8	2-5	68	99	143	72	24	24x 90	24x100	16
S-548	14000	2675.00	37	511	1-8	2-5	68	108	118	97	24	24x 70	28x 70	8
S-549	15800	3000.00	45	573	1-8	2-5	68	108	128	97	24	24x 70	28x 70	9
S-550	17600	3363.00	45	642	1-10	2-5	68	108	138	97	24	28x 70	32x 70	10
S-551	19400	3650.00	45	710	1-10	2-5	68	108	148	97	24	28x 80	32x 80	11
S-552	21000	3908.00	52	773	1-10	2-5	68	108	158	72	42	28x 90	32x 90	12
S-553	23200	4133.00	52	841	1-10	2-5	68	108	168	97	24	30x 75	36x 75	13
S-554	25000	4425.00	52	909	1-10	2-5	68	108	179	97	24	30x 80	36x 80	14
S-555	26800	4646.00	52	978	1-10	2-5	68	108	190	97	24	32x 80	36x 85	15
S-556	28800	4905.00	52	1046	1-10	2-5	68	108	201	97	24	32x 90	36x 90	16
S-557	30800	5153.00	52	1114	1-10	2-5	68	108	211	97	24	32x100	36x 95	17
S-558	32600	5385.00	52	1183	1-10	2-5	68	108	222	97	24	36x 80	36x100	18

NOTE:—The foregoing ratings provide that all piping (Mains and Risers, Flow and Return) in addition to the direct Radiation to be used, shall be figured as radiating surface in estimating the size of Boiler required. For indirect Radiation add 50 per cent. greater boiler power. Complete trimmings and fire tools furnished with boiler. All of above Boilers are equipped with Top and Side Headers.

For Measurements, see "Rough-in Section." Page 43.

# ROYAL

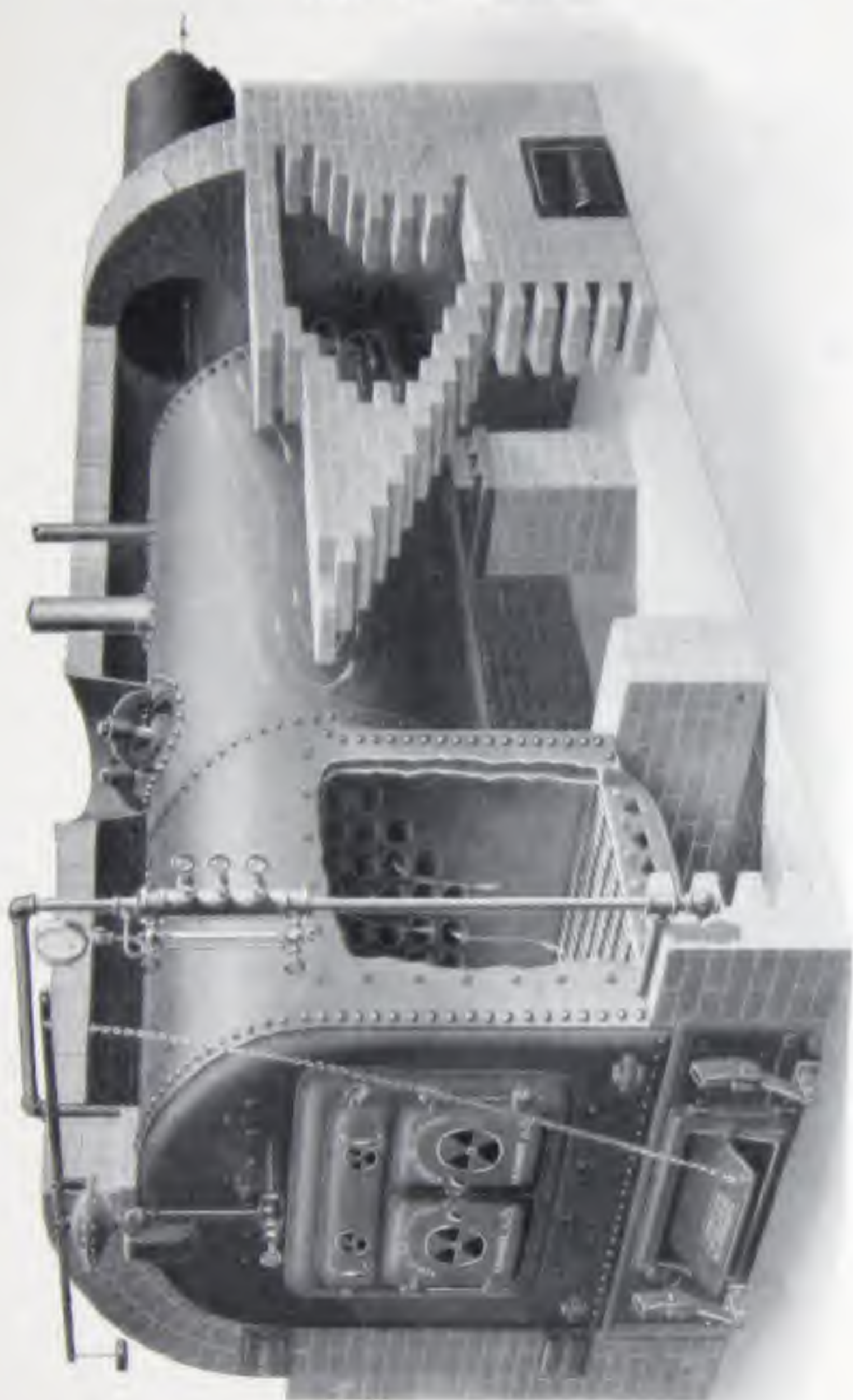
## SMOKELESS WATER BOILER WITH DOWN DRAFT GRATE

### PRICES, DIMENSIONS AND CAPACITIES

Size of Boiler	Rating Square Feet	List Price	Grate Surface Square Feet	Heating Surface Square Feet	No. and Size of Flow Connections	No. and Size of Return Connections	Height of Boiler	Length of Boiler	Width of Boiler	Size of Smoke Pipe	Chimney Flues Recommended		No. of Sections
											Round In. Ft.	Square In. Ft.	
W-338	7900	\$918.00	14.23	179	1-7	4-4	90	65	60	18	16x 50	16x 50	8
W-339	8900	986.00	17.	200	1-7	4-4	90	71	60	18	20x 50	20x 60	9
W-340	9900	1054.00	19.65	220	1-7	4-4	90	77½	60	18	20x 60	20x 60	10
W-341	10900	1104.00	22½	240	1-7	4-4	90	84	60	18	20x 60	20x 65	11
W-342	11900	1198.00	22½	262	1-7	4-4	90	90	60	18	20x 60	20x 65	12
W-343	12900	1276.00	25.1	283	2-6	2-4½	90	96½	60	18	20x 60	20x 75	13
W-344	14200	1325.00	25.1	316	2-6	2-4½	90	102½	60	18	20x 60	20x 75	14
W-345	15200	1428.00	28	337	2-6	2-4½	90	109	60	21	24x 60	24x 65	15
W-346	16500	1475.00	28	360	2-7	4-4½	90	115	60	21	24x 65	24x 70	16
W-347	18150	1548.00	28	378	2-7	4-4½	90	121½	60	21	24x 65	24x 70	17
W-409	14850	1540.00	24	324	2-8	4-6	99	93	72	21	24x 60	24x 65	9
W-410	16500	1617.00	27½	359	2-8	4-6	99	100	72	21	24x 60	24x 65	10
W-411	18150	1736.00	31.66	394	2-8	4-6	99	108	72	21	24x 65	24x 70	11
W-412	19800	1822.00	31.66	427	2-8	4-6	99	114½	72	21	24x 70	24x 75	12
W-413	21450	1933.00	31.66	461	2-8	4-6	99	121½	72	21	24x 75	24x 80	13
W-414	23100	2000.00	35.50	496	2-8	4-6	99	129	72	24	24x 80	24x 85	14
W-415	24750	2130.00	35.50	531	2-8	4-6	99	136	72	24	24x 85	24x 90	15
W-416	26400	2305.00	35.50	565	2-8	4-6	99	143	72	24	24x 90	24x 100	16
W-548	23100	2655.00	37½	511	1-8	2-6	108	118	97	24	24x 70	28x 70	8
W-549	26070	2980.00	45	573	1-8	2-6	108	128½	97	24	24x 70	28x 70	9
W-550	29040	3343.00	45	642	1-10	3-6	108	138½	97	24	28x 70	32x 70	10
W-551	32010	3630.00	45	710	1-10	3-6	108	148	97	24	28x 80	32x 80	11
W-552	34650	3888.00	52½	773	1-10	3-6	108	158½	97	24	28x 90	32x 90	12
W-553	38280	4113.00	52½	841	1-10	3-6	108	168½	97	24	30x 75	36x 75	13
W-554	41250	4405.00	52½	909	1-10	3-6	108	179	97	24	30x 80	36x 80	14
W-555	44220	4626.00	52½	978	1-10	3-6	108	190½	97	24	32x 80	36x 85	15
W-556	47520	4885.00	52½	1046	1-10	3-6	108	201	97	24	32x 90	36x 90	16
W-557	50820	5133.00	52½	1114	1-10	3-6	108	211½	97	24	32x 100	36x 95	17
W-558	53790	5365.00	52½	1133	1-10	3-6	108	222	97	24	36x 80	36x 100	18

NOTE:—The foregoing ratings provide that all piping (Mains and Risers, flow and return) in addition to the direct Radiation to be used, shall be figured as Radiating Surface in estimating the size of boiler required. For indirect Radiation add 50 per cent. greater boiler power. Complete trimming and firing tools furnished with boiler. All of above Boilers are equipped with Top and Side Headers. For Measurements, see Roughing-in Section, Page 43.

**TYPICAL FIRE BOX BOILER  
FOR HEATING**



## SPECIFICATIONS

## TYPICAL FIRE BOX BOILERS

## BRICK-SET TYPE

Built in accordance with American Society Mechanical Engineers Code of Boiler Rules

These Boilers will heat all the radiation shown by their capacity

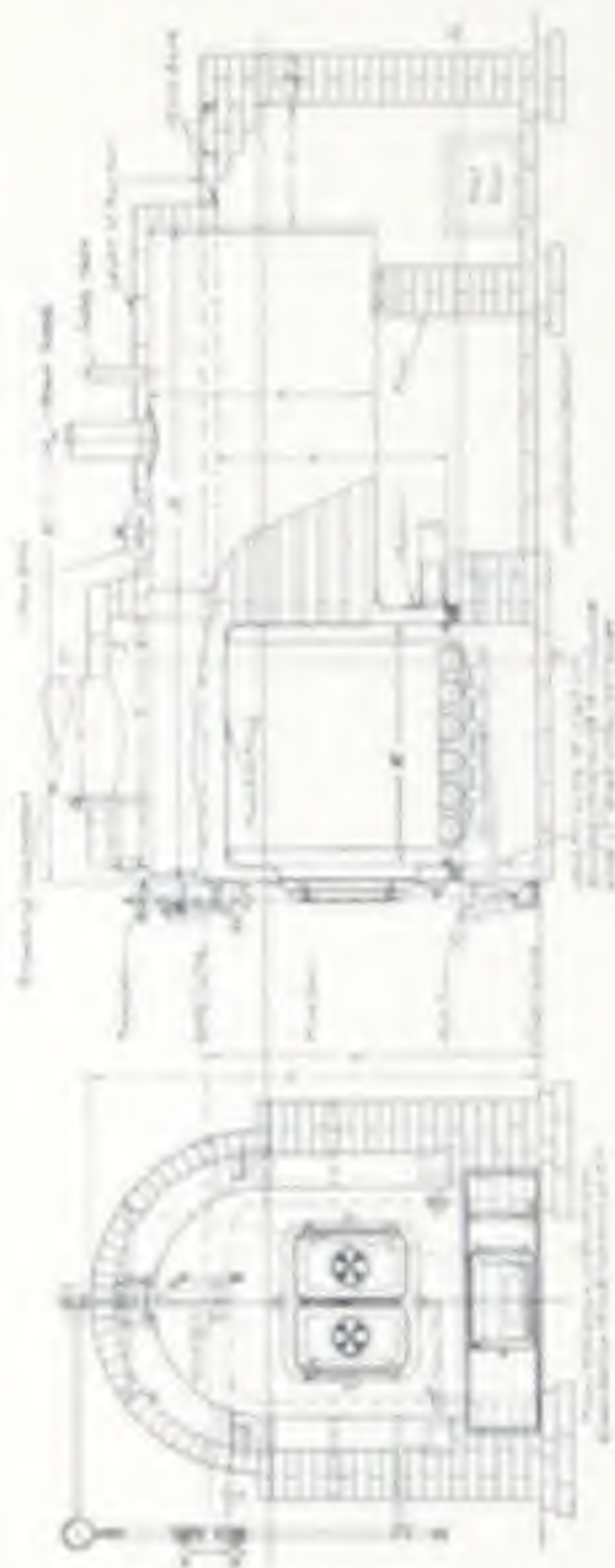
Number of Boiler..	1	2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	20
Code, Steam Boiler	<b>Dagon</b>	<b>Daft</b>	<b>Daub</b>	<b>Dawn</b>	<b>Dairy</b>	<b>Damp</b>	<b>Dash</b>	<b>Data</b>	<b>Dated</b>	<b>Dead</b>	<b>Dear</b>	<b>Debut</b>	<b>Defer</b>	<b>Devil</b>	<b>Deist</b>	<b>Delve</b>	<b>Demit</b>	<b>Dense</b>	<b>Dart</b>
Code, Water Boiler	<b>Dirty</b>	<b>Deter</b>	<b>Dingy</b>	<b>Dirge</b>	<b>Darn</b>	<b>Debar</b>	<b>Drill</b>	<b>Draft</b>	<b>Degs</b>	<b>Drink</b>	<b>Debut</b>	<b>Decay</b>	<b>Dusk</b>	<b>Decot</b>	<b>Decry</b>	<b>Deflux</b>	<b>Delta</b>	<b>Demon</b>	<b>Dental</b>
Cap., Steam, sq. ft.	900	1050	1200	1400	1700	2000	2600	3000	3500	4000	4500	5500	6500	7500	8700	10000	11000	12000	14000
Cap., Water, sq. ft.	1500	1700	2000	2300	2800	3300	4300	5000	5800	6600	7400	9100	10700	12400	14400	16500	18200	19800	23100
Diam. of Boiler, in.	30	30	30	36	36	36	42	42	48	48	48	54	54	60	60	66	66	72	72
Length of Boiler																			
Over-all, . . . . . ft.	6 1/2	7 1/2	8 1/2	7 1/2	9	10 1/2	10	11 1/2	10 1/2	12	13 1/2	14	16 1/2	15 1/2	18	16	18	16	18
Width of Fire-box, . . . . . in.	24	24	24	30	30	30	36	36	42	42	42	48	48	53	53	59	59	65	65
Lgth. of fire-box, in.	26	32	38	32	38	44	44	50	44	50	56	56	62	62	68	62	68	68	74
Height of Fire-box, . . . . . in.	35	35	35	38	38	38	41	41	44	44	44	49	49	54	54	59	59	64	64
Approx. Wght., lbs.	2400	2700	2900	3300	3700	4200	5400	6000	6700	7300	8000	10600	11900	14400	16000	17800	19100	21700	23500

**SPECIFICATIONS TYPICAL FIRE BOX BOILERS BRICK-SET TYPE—Cont.,**  
**Boiler in accordance with American Society Mechanical Engineers Code of Boiler Rules**

Number of Boilers.	3	4	5	6	8	10	11	12	13	14	15	16	17	18	19	20
Usual Surface sq. ft.	114	131	147	160	215	250	300	350	368	420	472	500	573	636	1080	1320
Area of Grate sq. ft.	4.4	5.4	6.4	6.8	8.0	9.3	11.1	12.6	12.6	14.8	16.8	20.8	22.9	25.1	28.0	31.5
Dist. of Bracing, in.	12	14	16	18	18	22	22	22	24	24	28	28	32	32	32	36
Dist. of Stacks, in.	12	12	14	14	16	16	18	20	20	22	26	26	30	30	30	34
Min. Ht. of Stack, ft.	40	40	40	40	45	45	45	45	50	50	50	50	55	55	60	60
Dist. of Bracing																
Two Boilers	18	20	22	24	24	26	32	32	34	36	36	40	40	40	44	46
Dist. of Stack, even																
Boilers	18	18	20	22	22	26	28	30	32	34	36	40	40	40	40	42
Min. Ht. of Stack,																
Two Boilers	45	45	45	45	45	50	50	50	50	50	60	60	70	70	70	70
Size of Steam Pipe																
in.	4	4	5	5	6	6	6	6	6	7	7	7	7	8	8	8
Size of Return	2 1/2	2 1/2	3	3	3	4	4	4	4	5	5	5	5	6	6	6
Size of Safety																
Valve	1	1 1/2	1 1/2	1 1/2	1 1/2	2	2	2	2 1/2	2 1/2	3	3	3 1/2	3 1/2	4	4
Ht. of Water-line	32	32	32	35	35	35	38	38	41	45	45	45	45	45	45	45
Ht. from Floor to																
Top of Brick Work	70	70	70	77	77	77	83	83	90	90	90	90	108	108	120	120
Length	8-7	9-0	10-6	10-8	12-2	12-8	14-7	14-7	15-0	17-0	17-0	18-0	18-7	21-1	21-1	21-5
Width	5-0	5-0	5-0	5-0	5-6	5-6	6-0	6-0	6-0	7-8	7-8	7-8	8-2	8-8	8-8	9-2
Width Double																
Setting	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3	0-3
No. of Com. Bricks	1400	1600	1730	1800	2150	2400	2900	3000	3300	3600	3600	4000	4500	4900	7700	8200
Com. Brick for Two																
Boilers	2450	2700	2930	3000	3730	4100	4750	5400	5800	6350	6350	7000	7900	8400	11250	11850

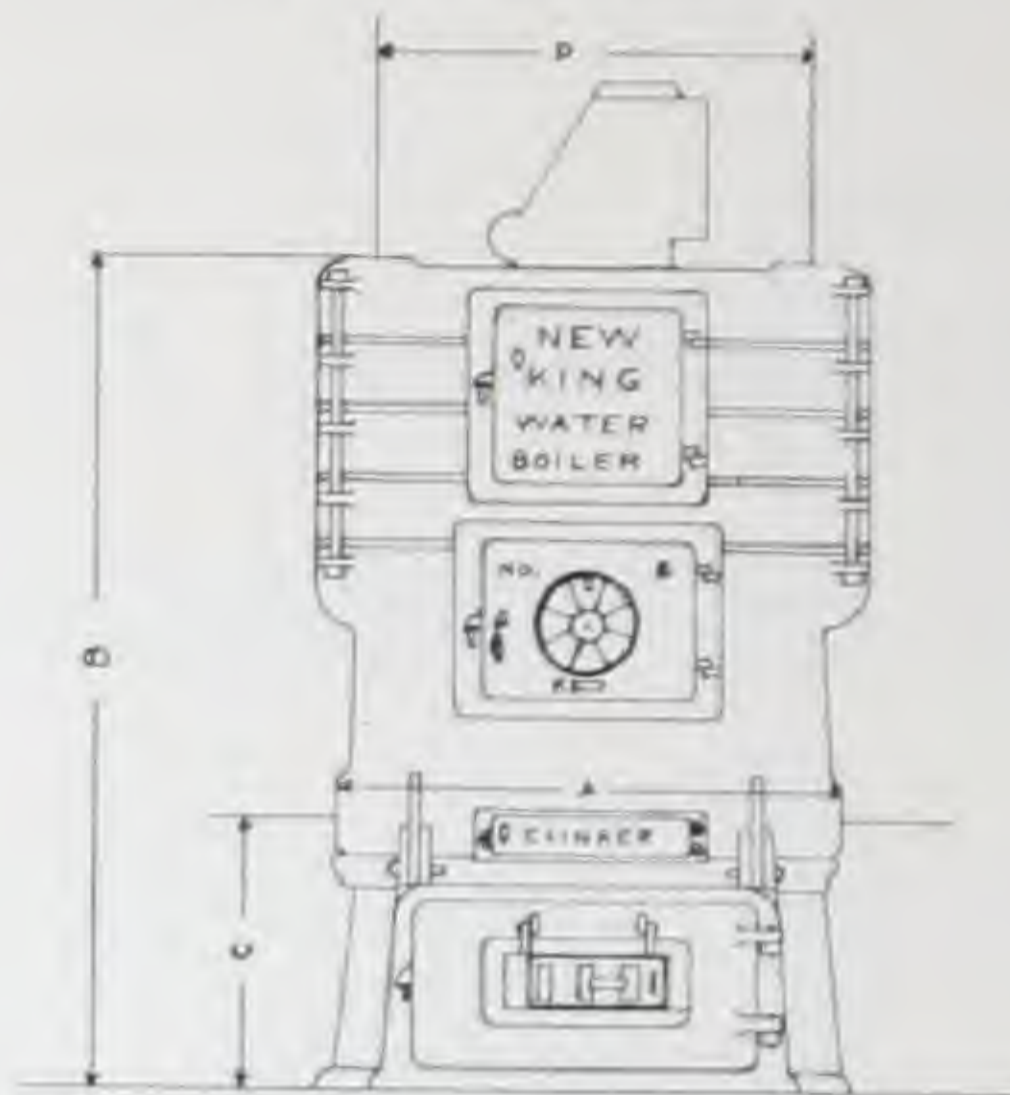
SECTION TYPICAL FIRE BOX BOILER  
BRICK SET

Showing Setting with Slack Connection at Front.



**ROUGHING IN  
MEASUREMENTS  
FOR  
BOILERS**

## NEW KING HOT WATER BOILERS TAP OUTLET TYPE



- A.—Width in inches from left hand return inlet to right hand return inlet.
- B.—Distance from floor to top of flow outlets.
- C.—Distance from floor to centre of return inlet.
- D.—Distance from centre of left hand flow outlet to right hand flow outlet.

For Prices, Ratings, etc., see pages 7, 8

**NEW KING**  
**HOT WATER BOILER—LOW BASE**  
**TAP OUTLET TYPE**

TABLE OF MEASUREMENTS

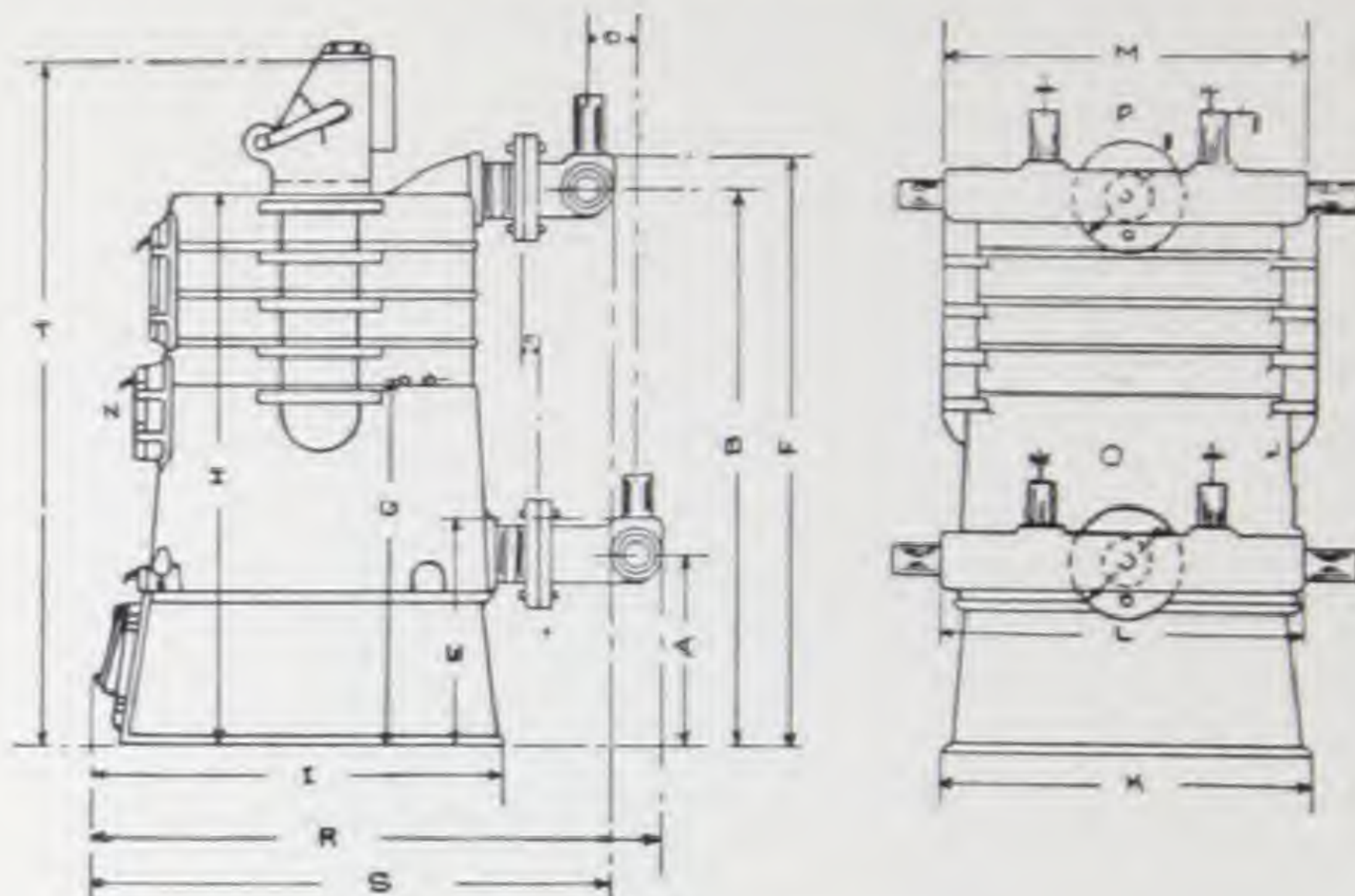
Size	A	B	C	D
2C .....	23 1/2"	44"	16 1/2"	19 1/2"
2 .....	23 1/2"	48"	16 1/2"	19 1/2"
2 1/2 .....	23 1/2"	52"	16 1/2"	19 1/2"
3C .....	25 3/4"	43"	16 1/2"	21 1/4"
3 .....	25 3/4"	47"	16 1/2"	21 1/4"
3 1/2 .....	25 3/4"	51"	16 1/2"	21 1/4"
4C .....	29"	44"	16 1/2"	24 1/2"
4 .....	29"	48"	16 1/2"	24 1/2"
4 1/2 .....	29"	52"	16 1/2"	24 1/2"
5C .....	31 1/4"	47"	18 5/8"	26"
5 .....	31 1/4"	51 1/4"	18 5/8"	26"
5 1/2 .....	31 1/4"	55 1/2"	18 5/8"	26"
6C .....	33 1/2"	46 7/8"	18 1/8"	28 3/4"
6 .....	33 1/2"	50 7/8"	18 1/8"	28 3/4"
6-A .....	33 1/2"	54 7/8"	18 1/8"	28 3/4"
6 1/2 C .....	36 1/2"	54"	21 1/2"	31 1/4"
6 1/2 .....	36 1/2"	59"	21 1/2"	31 1/4"
6 1/2 A .....	36 1/2"	64"	21 1/2"	31 1/4"
7C .....	39"	55"	20 3/4"	34"
7 .....	39"	60"	20 3/4"	34"
7 1/2 .....	39"	65"	20 3/4"	34"
8C .....	44 1/2"	55 3/4"	24"	39"
8 .....	44 1/2"	62 1/4"	24"	39"
8 1/2 .....	44 1/2"	66 3/4"	24"	39"

**NOTE—ADD FOR HIGH BASE:—**

No. 2—6 3/4"; No. 3—7"; No. 4—6 15/16"; No. 5—7 3/8"; No. 6—6 1/2"; No. 6 1/2—5 15/16"; No. 7—6 1/8"; No. 8—6 1/8".

# NEW KING HOT WATER BOILER

## Details of Measurements



## Details of Measurements

- A Floor to Centre of Return End opening.
- B " " " " Flow " "
- C Distance Face of Return Flange projects past Face of Flow Flange.
- D " " Centre of Return opening projects past Centre of Flow opening.
- E Floor to Top of Return opening.
- F " " " " Flow " "
- G " " Centre of Domestic Heater openings.
- H " " Bottom of Smoke Collar.
- I Overall Measurement Front to back of Ash-pit.
- K " " Side to Side " "
- L " " Length of Return Header, Western Header.
- M " " Flow Header " "
- N " " Branch Return Header.
- M " " Flow " "
- N Size of Fire Door.
- O Distance Centre to Centre Return openings, Western Header.
- P " " " " Flow " "
- O " " " " Branch Return Header openings.
- P " " " " Branch Flow Header openings.
- R Overall Measurement Front of Ash-pit to back of Return Header.
- S " " " " " " Flow Header.
- T Floor to Top of Draft Control.
- U Size and Diameter of Flow and Return Flanges.

NEW KING  
HOT WATER BOILER  
TABLE OF MEASUREMENTS

No.	A	B	C	D	E	F	G	H	I	K	Western		Branch		N	Western		Branch		R	S	T	U
											L	M	L	M		O	P						
2C	16	43	1	3	19	46	31	43	26	26	18	18	16	9	8 x 12	13	13	4	41	37	54	4x 9	
2	16	47	1	3	19	50	31	47	26	26	18	18	16	9	8 x 12	13	13	4	41	37	58	4x 9	
2½	16	51	1	3	19	54	31	51	26	26	18	18	16	9	8 x 12	13	13	4	41	37	62	4x 9	
3C	16	42	1	3	19	45	30	42	30	28	18	18	16	9	8 x 12	13	13	4	42	38	53	4x 9	
3	16	46	1	3	19	49	30	46	30	28	18	18	16	9	8 x 12	13	13	4	42	38	57	4x 9	
3½	16	50	1	3	19	53	30	50	30	28	18	18	16	9	8 x 12	13	13	4	42	38	61	4x 9	
4C	16	43	1	3	19	46	31	43	32	30	18	18	16	9	8 x 12	13	13	4	45	41	54	4x 9	
4	16	47	1	3	19	50	31	47	32	30	18	18	16	9	8 x 12	13	13	4	45	41	58	4x 9	
4½	16	51	1	3	19	54	31	51	32	30	18	18	16	9	8 x 12	13	13	4	45	41	62	4x 9	
5C	18	46	1	5	21	49	33	46	35	33	20	20	37	36	8 x 13	14	14	7	47	40	65	5x 10	
5	18	50	1	5	21	53	33	50	35	33	20	20	37	36	8 x 13	14	14	7	47	40	69	5x 10	
5½	18	55	1	5	21	57	33	54	35	33	20	20	37	36	8 x 13	14	14	7	47	40	73	5x 10	
6C	18	46	1	5	21	49	33	46	38	36	20	20	37	36	8 x 13	14	14	7	53	46	65	5x 10	
6	18	50	1	5	21	53	33	50	38	36	20	20	37	36	8 x 13	14	14	7	53	46	69	5x 10	
6A	18	54	1	5	21	57	33	54	38	36	20	20	37	36	8 x 13	14	14	7	53	46	73	5x 10	
6½C	21	53	1	10	24	56	37	51	44	39	23	23	45	45	9 x 15	17	17	7	64	53	69	6x 11	
6½	21	58	1	10	24	61	37	56	44	39	23	23	45	45	9 x 15	17	17	7	64	53	74	6x 11	
6½A	21	63	1	10	24	66	37	60	44	39	23	23	45	45	9 x 15	17	17	7	64	53	79	6x 11	
7C	20	54	1	10	23	56	36	52	44	41	23	23	56	56	9 x 15	17	17	6	62	51	70	6x 11	
7	20	59	1	10	23	61	36	57	44	41	23	23	56	56	9 x 15	17	17	6	62	51	75	6x 11	
7½	20	64	1	10	23	66	36	62	44	41	23	23	56	56	9 x 15	17	17	6	62	51	80	6x 11	
8C	24	55	2	10	26	58	37	54	52	46	24	24	69	69	9 x 16	18	18	6	73	62	70	7x 12	
8	24	61	2	10	26	64	37	59	52	46	24	24	69	69	9 x 16	18	18	6	73	62	76	7x 12	
8½	24	66	2	10	26	68	37	64	52	46	24	24	69	69	9 x 16	18	18	6	73	62	81	7x 12	

NOTE—For High Base Boilers add to above measurements as follows:

No. 2-6¾", No. 3-7", No. 4-6½", No. 5-7½", No. 6-6½", No. 7-6½", No. 8-6½".

For Prices and Ratings, see Pages 7-8.

NEW KING HOT WATER BOILERS  
TABLE OF MEASUREMENTS OF TWIN CONNECTIONS—LOW BASE

Size of Boiler	No. and Size of Outlets	Valve	Diameter of Flanges	Length of Header		Inside Diam. of Header	C to C of Flanges on Flow Header	C to C of Flanges on Return Header	C to C of Flanges	Flow and Return Header	Floor to centre of end opening		Floor to top of headers		Overall depth		Distance from face of return flange to face of flow flange	Dia. centre of riser opening per feet past return	Size of expansion pipe
				Flow	Return						Flow	Return	Flow	Return	Width	Depth			
2	2C	4	6	44	44	44	34	34	34	27	43 1/2	16 1/2	40	10	58	54	11	11	1 1/2
3	3C	4	6	44	44	44	34	34	34	31	47 1/2	16 1/2	50	10	58	54	11	11	1 1/2
4	4C	4	6	44	44	44	34	34	34	35	51 1/2	16 1/2	54	10	58	54	11	11	1 1/2
5	5C	4	6	58	58	58	44	44	44	26	42 1/2	16 1/2	45	10	71	62	11	11	1 1/2
6	6C	4	6	58	58	58	44	44	44	30	46 1/2	16 1/2	49	10	71	62	11	11	1 1/2
7	7C	4	6	58	58	58	44	44	44	34	50 1/2	16 1/2	53	10	71	62	11	11	1 1/2
8	8C	4	6	58	58	58	44	44	44	27	43 1/2	16 1/2	46	10	71	62	11	11	1 1/2
9	9C	4	6	58	58	58	44	44	44	31	47 1/2	16 1/2	50	10	71	62	11	11	1 1/2
10	10C	4	6	58	58	58	44	44	44	35	51 1/2	16 1/2	54	10	71	62	11	11	1 1/2
11	11C	4	6	72	72	72	45	45	45	27 1/2	46 1/2	18 1/2	49 1/2	21 1/2	80	65	10	10	1 1/2
12	12C	4	6	72	72	72	45	45	45	32 1/2	50 1/2	18 1/2	54 1/2	21 1/2	80	65	10	10	1 1/2
13	13C	4	6	72	72	72	45	45	45	36 1/2	54 1/2	18 1/2	58 1/2	21 1/2	80	65	10	10	1 1/2
14	14C	4	6	72	72	72	45	45	45	38 1/2	56 1/2	18 1/2	60 1/2	21 1/2	80	65	10	10	1 1/2
15	15C	4	6	72	72	72	45	45	45	42 1/2	60 1/2	18 1/2	64 1/2	21 1/2	80	65	10	10	1 1/2
16	16C	4	6	86	86	86	54	54	54	32	54 1/2	20 1/2	58 1/2	23 1/2	98	67	10	10	1 1/2
17	17C	4	6	100	100	100	57	57	57	33 1/2	54 1/2	20 1/2	58 1/2	23 1/2	100	72	12	12	1 1/2
18	18C	4	6	100	100	100	57	57	57	38 1/2	58 1/2	20 1/2	63 1/2	23 1/2	100	72	12	12	1 1/2
19	19C	4	6	100	100	100	57	57	57	43 1/2	64 1/2	20 1/2	68 1/2	23 1/2	100	72	12	12	1 1/2
20	20C	4	7	128	128	128	65	65	65	31 1/2	57 1/2	21 1/2	61 1/2	25 1/2	128	83	10	10	1 1/2
21	21C	4	7	128	128	128	65	65	65	37 1/2	62 1/2	21 1/2	66 1/2	25 1/2	128	83	10	10	1 1/2
22	22C	4	7	128	128	128	65	65	65	42 1/2	68 1/2	21 1/2	72 1/2	25 1/2	128	83	10	10	1 1/2
23	23C	4	7	128	128	128	65	65	65	37 1/2	57 1/2	21 1/2	61 1/2	25 1/2	128	83	10	10	1 1/2
24	24C	4	7	128	128	128	65	65	65	42 1/2	62 1/2	21 1/2	66 1/2	25 1/2	128	83	10	10	1 1/2
25	25C	4	7	128	128	128	65	65	65	47 1/2	68 1/2	21 1/2	72 1/2	25 1/2	128	83	10	10	1 1/2

NOTES.—Space occupied. Width means distance between outside of bases. Depth means distance from front of Ashpit to back of Return Header. Standard centre of Header Tappings—2" outlets 7" centres, 2 1/2" outlets 8 1/2" centres, 3" outlets 10 1/2" centres, 3 1/2" outlets 12" centres, 4" outlets 13" centres, 4 1/2" outlets 14" centres, 5" outlets 15" centres, 6" outlets 16" centres.

The above measurements are for Low Base Boilers. For High Base Boilers add follows:—No. 2C to 2 1/2-6 1/4", No. 3C to 3 1/2-7", No. 4C to 4 1/2-6 1/4", No. 5C to 5 1/2-7 1/4", No. 6C to 6A-6 1/2", No. 6 1/2C to 6 1/2A-5 1/2", No. 7C to 7 1/2-6 1/4", No. 8C to 8 1/2-6 1/4", No. 9C to 9 1/2-6 1/4". For Prices, Capacities, etc., see pages 7 & 8.

# ROYAL WATER AND LAUNDRY HEATERS

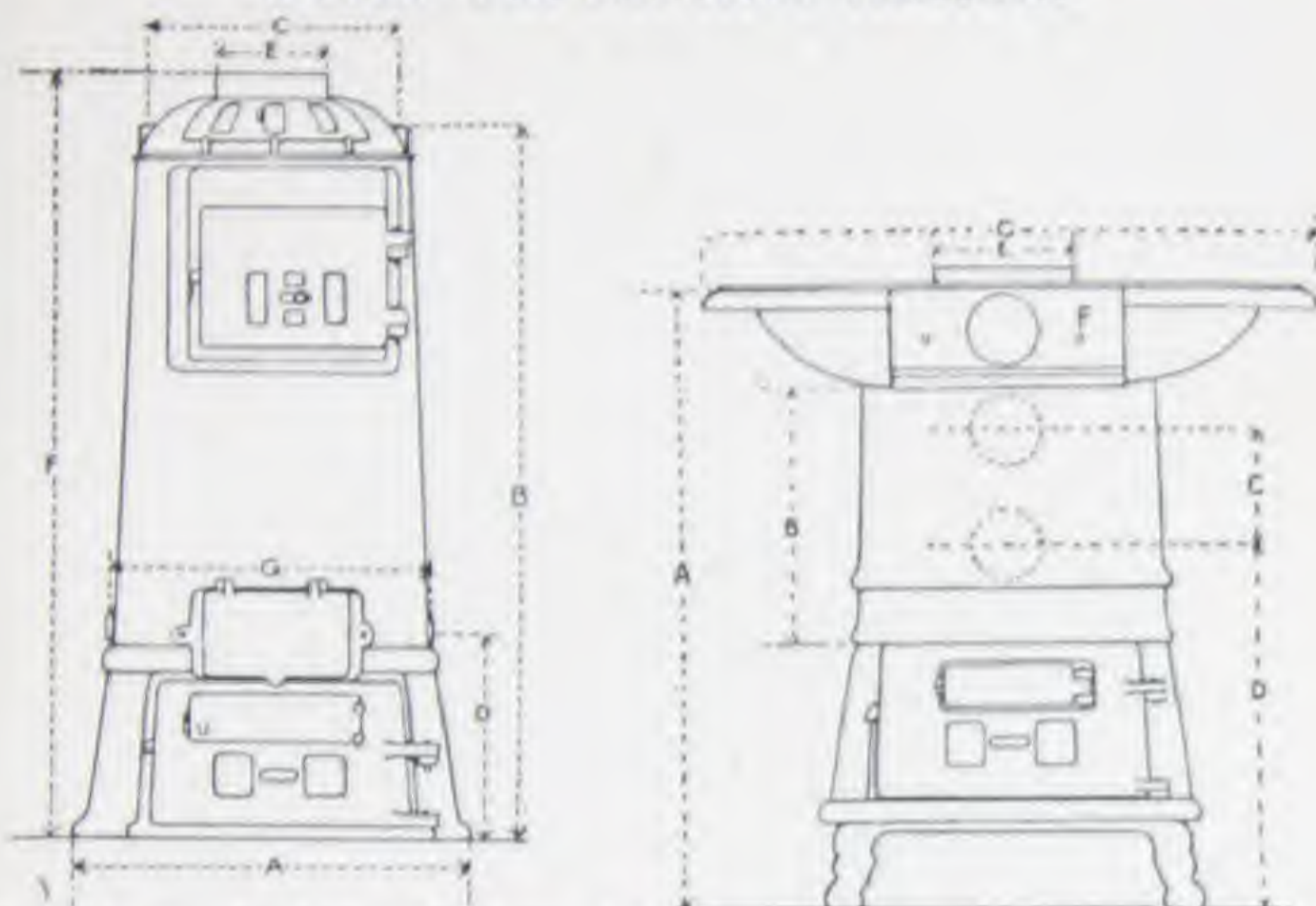


TABLE OF MEASUREMENTS AS INDICATED ON SKETCH ABOVE

No.	A	B	C	D	E	F	G
0	18	23	.....	9½	5	24½	.....
10	18	29	.....	9½	5	32	.....
12	20	31	.....	10	4x6 oval	34	.....
112	20	35½	.....	10	4x6 oval	38	.....
15	23	36½	.....	14½	4½x7 oval	40	.....
115	23	41	.....	14½	4½x7 oval	45	.....
18	24½	42	17½	14"	7" Rd.	47½	24½"
118	24½	48½	17½	14"	7" "	54"	24½"

## ROYAL LAUNDRY HEATER

No.	A	B	C	D	E	F	G
1	27	12	6½	14½	4½ x 7	5½x9½	27½

Note:—On No. 0 and 10, 1 Flow opening is on top of Firepot at back, 1 Return opening on side.

On No. 12, 112, 15, 115, 1 Flow opening is on top of Fire pot in centre. Also 1 Return opening on Back of Fire pot.

No. 18 and 118 have 3-2" flow openings on top of heater and 3-2" corresponding return inlets at back and sides of heater.

For prices and capacities see Pages 14-15-16

# ROYAL ROUND STEAM BOILERS

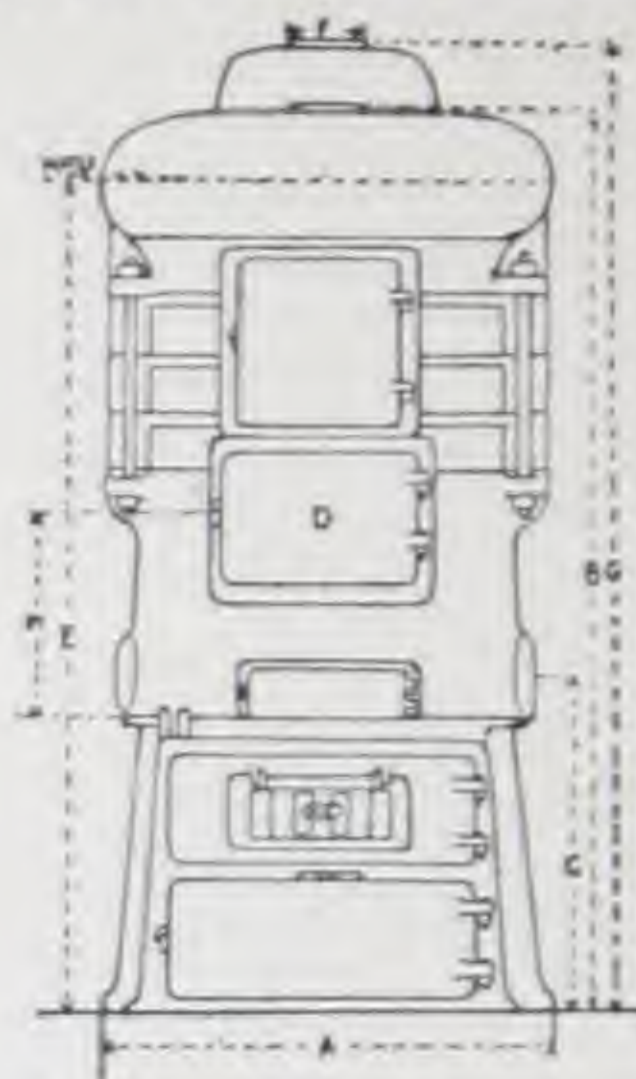


TABLE OF MEASUREMENTS AS INDICATED ON SKETCH ABOVE

No.	A	B	C	D	E	G	H
3-19-S	28	49 $\frac{1}{8}$	15 $\frac{3}{4}$	8 x12	41 $\frac{1}{2}$	57	15
4-19-S	28	53 $\frac{1}{8}$	15 $\frac{3}{4}$	8 x12	45 $\frac{1}{2}$	61	15
5-19-S	23	57 $\frac{1}{8}$	15 $\frac{3}{4}$	8 x12	49 $\frac{1}{2}$	65	15
4-22-S	30	55	15 $\frac{1}{4}$	8 x12	44 $\frac{1}{2}$	62	15
5-22-S	30	59	15 $\frac{1}{4}$	8 x12	48 $\frac{1}{2}$	66	15
4-25-S	32	55	15 $\frac{1}{4}$	8 x12 $\frac{1}{4}$	45 $\frac{1}{2}$	62	15 $\frac{5}{8}$
5-25-S	32	59	15 $\frac{3}{4}$	8 x12 $\frac{1}{4}$	49 $\frac{1}{2}$	66	15 $\frac{5}{8}$
3-28-S	40	56 $\frac{3}{4}$	17 $\frac{1}{4}$	9 x14	44 $\frac{1}{2}$	63 $\frac{1}{4}$	16 $\frac{1}{2}$
4-28-S	34 $\frac{3}{4}$	61 $\frac{1}{4}$	17 $\frac{1}{4}$	9 x14	48 $\frac{1}{2}$	68 $\frac{1}{4}$	16 $\frac{1}{2}$
5-28-S	34 $\frac{3}{4}$	65 $\frac{3}{4}$	17 $\frac{1}{4}$	9 x14	52 $\frac{1}{2}$	72 $\frac{3}{4}$	16 $\frac{1}{2}$
4-31-S	37	62 $\frac{1}{4}$	19 $\frac{1}{2}$	9 $\frac{1}{2}$ x15 $\frac{1}{2}$	48 $\frac{1}{2}$	70 $\frac{1}{4}$	17
5-31-S	37	66 $\frac{3}{4}$	19 $\frac{1}{2}$	9 $\frac{1}{2}$ x15 $\frac{1}{2}$	52 $\frac{1}{2}$	79 $\frac{3}{4}$	17
4-34-S	40	69 $\frac{1}{4}$	20	9 $\frac{1}{2}$ x15 $\frac{1}{2}$	56	76 $\frac{1}{4}$	18
5-34-S	40	70	20	9 $\frac{1}{4}$ x15 $\frac{1}{2}$	60 $\frac{3}{4}$	82	18

NOTE:—The above measurements are for Low Base Boilers. To arrive at height of high Base Boilers, add as follows:—

19 in. Boilers 6  $\frac{3}{4}$  in.

25 in. Boilers 6  $\frac{3}{4}$  in.

31 in. Boilers 7 in.

22 in. Boilers 6  $\frac{3}{4}$  in.

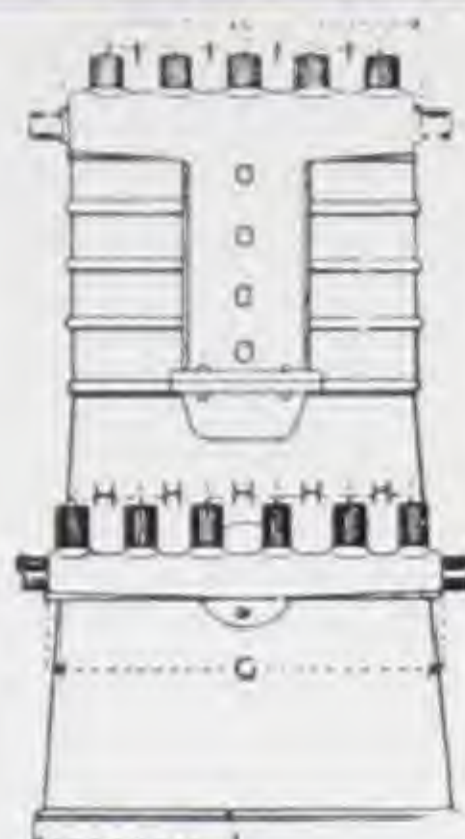
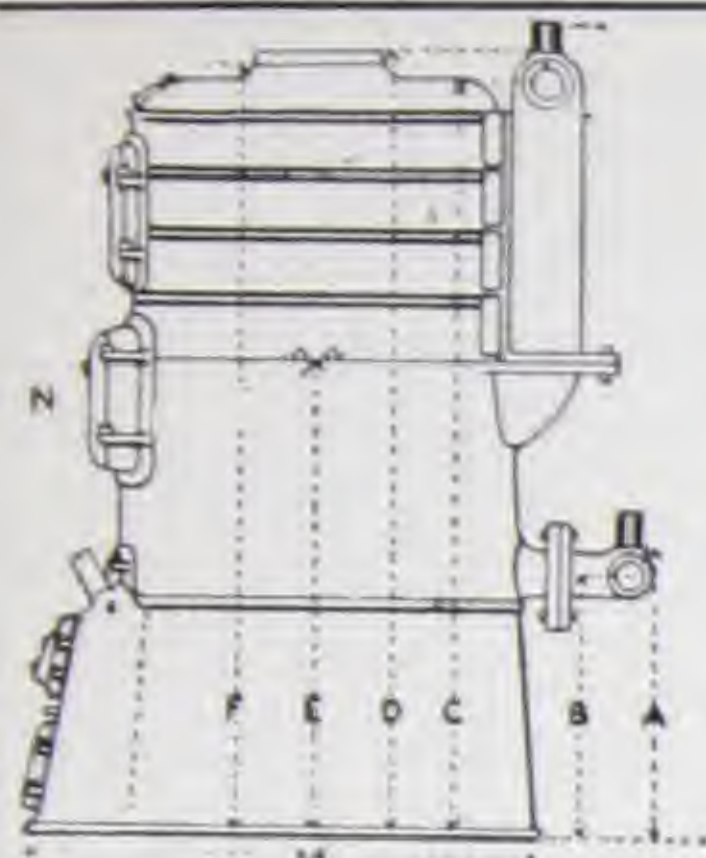
28 in. Boilers 7  $\frac{1}{4}$  in.

34 in. Boilers 8 in.

For Prices and Capacities see Boiler Section Pages 17-18.

# KING HOT WATER BOILERS

TABLE OF  
MEASUREMENTS



	No.	A	B	C	D	E	F	G	H	I	K	L	M	N
HIGH P A S E	1	25	22 $\frac{1}{2}$	51 $\frac{1}{16}$	53 $\frac{5}{8}$	37 $\frac{3}{16}$	51 $\frac{7}{8}$	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{3}{4}$	28	29	8 x12
	2	25	22 $\frac{1}{2}$	55	57 $\frac{1}{2}$	37 $\frac{3}{16}$	55 $\frac{7}{8}$	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	28	29	8 x12
	2 $\frac{1}{2}$	25	22 $\frac{1}{2}$	59	61 $\frac{1}{2}$	37 $\frac{3}{16}$	59 $\frac{3}{4}$	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	28	29	8 x12
	3	25	22 $\frac{1}{2}$	54 $\frac{3}{4}$	57 $\frac{1}{8}$	36 $\frac{7}{8}$	55 $\frac{3}{4}$	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	30 $\frac{1}{4}$	31 $\frac{3}{4}$	8 x12
	3 $\frac{1}{2}$	25	22 $\frac{1}{2}$	58 $\frac{1}{2}$	61	36 $\frac{7}{8}$	59 $\frac{1}{8}$	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	30 $\frac{1}{4}$	31 $\frac{3}{4}$	8 x12
	4	25 $\frac{1}{4}$	22 $\frac{1}{8}$	55 $\frac{1}{2}$	58	37 $\frac{3}{4}$	56 $\frac{1}{2}$	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	31 $\frac{3}{4}$	33 $\frac{3}{8}$	8 x12
	4 $\frac{1}{2}$	25 $\frac{1}{4}$	22 $\frac{1}{8}$	59 $\frac{3}{8}$	61 $\frac{7}{8}$	37 $\frac{3}{4}$	60 $\frac{3}{8}$	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	31 $\frac{3}{4}$	33 $\frac{3}{8}$	8 x12
	5	27 $\frac{1}{2}$	24 $\frac{3}{4}$	60 $\frac{7}{8}$	63	40 $\frac{1}{4}$	61	24 $\frac{1}{8}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	30 $\frac{3}{4}$	35	36	8 $\frac{1}{2}$ x13 $\frac{1}{2}$
	5 $\frac{1}{2}$	27 $\frac{1}{2}$	24 $\frac{3}{4}$	65 $\frac{1}{4}$	67 $\frac{1}{2}$	40 $\frac{1}{4}$	64 $\frac{5}{8}$	24 $\frac{1}{8}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	30 $\frac{3}{4}$	35	36	8 $\frac{1}{2}$ x13 $\frac{1}{2}$
	6	26 $\frac{1}{2}$	24	61	63 $\frac{1}{4}$	40 $\frac{1}{4}$	60 $\frac{3}{4}$	24 $\frac{1}{8}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	30 $\frac{3}{4}$	37 $\frac{3}{4}$	39 $\frac{1}{2}$	8 $\frac{1}{2}$ x13 $\frac{1}{2}$
	6A	26 $\frac{1}{2}$	24	65 $\frac{1}{2}$	67 $\frac{3}{4}$	40 $\frac{1}{4}$	65 $\frac{1}{4}$	24 $\frac{1}{8}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	30 $\frac{3}{4}$	37 $\frac{3}{4}$	39 $\frac{1}{2}$	8 $\frac{1}{2}$ x13 $\frac{1}{2}$
	6 $\frac{1}{2}$	29 $\frac{3}{4}$	27 $\frac{1}{4}$	67 $\frac{1}{4}$	69 $\frac{1}{2}$	42 $\frac{3}{8}$	64 $\frac{3}{4}$	45	7	7	45 $\frac{1}{4}$	40 $\frac{1}{4}$	43 $\frac{1}{4}$	9 $\frac{1}{4}$ x15
	6 $\frac{1}{2}$ A	29 $\frac{3}{4}$	27 $\frac{1}{4}$	71 $\frac{3}{4}$	74	42 $\frac{3}{8}$	69 $\frac{1}{2}$	45	7	7	45 $\frac{1}{4}$	40 $\frac{1}{4}$	43 $\frac{1}{4}$	9 $\frac{1}{4}$ x15
	7	29 $\frac{3}{4}$	27 $\frac{1}{4}$	67 $\frac{3}{8}$	69 $\frac{5}{8}$	42 $\frac{1}{2}$	65 $\frac{1}{8}$	56 $\frac{1}{2}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	56 $\frac{1}{2}$	42 $\frac{1}{2}$	46	9 $\frac{1}{4}$ x15
	7 $\frac{1}{2}$	29 $\frac{3}{4}$	27 $\frac{1}{4}$	72 $\frac{1}{4}$	74 $\frac{1}{2}$	42 $\frac{1}{2}$	70	56 $\frac{1}{2}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	56 $\frac{1}{2}$	42 $\frac{1}{2}$	46	9 $\frac{1}{4}$ x15
LOW B A S E	8	31 $\frac{1}{8}$	28 $\frac{3}{4}$	70 $\frac{1}{2}$	72 $\frac{3}{4}$	43 $\frac{1}{2}$	68 $\frac{3}{8}$	68 $\frac{7}{8}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	68 $\frac{7}{8}$	47 $\frac{3}{4}$	51	9 $\frac{1}{2}$ x16
	8 $\frac{1}{2}$	31 $\frac{1}{8}$	28 $\frac{3}{4}$	75 $\frac{3}{4}$	77 $\frac{7}{8}$	43 $\frac{1}{2}$	73 $\frac{1}{4}$	68 $\frac{7}{8}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	68 $\frac{7}{8}$	47 $\frac{3}{4}$	51	9 $\frac{1}{2}$ x16
	9	31 $\frac{1}{2}$	29 $\frac{1}{8}$	71	73 $\frac{1}{4}$	43 $\frac{1}{2}$	68	68 $\frac{7}{8}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	68 $\frac{7}{8}$	50	53 $\frac{1}{2}$	9 $\frac{1}{2}$ x16
	9 $\frac{1}{2}$	31 $\frac{1}{2}$	29 $\frac{1}{8}$	76	78 $\frac{1}{4}$	43 $\frac{1}{2}$	73	68 $\frac{7}{8}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	68 $\frac{7}{8}$	50	53 $\frac{1}{2}$	9 $\frac{1}{2}$ x16
	1	18 $\frac{1}{4}$	15 $\frac{3}{4}$	44 $\frac{1}{16}$	46 $\frac{7}{8}$	30 $\frac{3}{16}$	45 $\frac{1}{8}$	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{3}{4}$	26 $\frac{1}{2}$	27 $\frac{1}{2}$	8 x12
	2	18 $\frac{1}{4}$	15 $\frac{3}{4}$	48 $\frac{3}{16}$	50 $\frac{7}{8}$	30 $\frac{3}{16}$	49	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	26 $\frac{1}{2}$	27 $\frac{1}{2}$	8 x12
	2 $\frac{1}{2}$	18 $\frac{1}{4}$	15 $\frac{3}{4}$	52 $\frac{1}{4}$	54 $\frac{3}{4}$	30 $\frac{3}{16}$	53	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	26 $\frac{1}{2}$	27 $\frac{1}{2}$	8 x12
	3	18	15 $\frac{1}{2}$	47 $\frac{3}{4}$	50 $\frac{1}{4}$	30 $\frac{1}{8}$	49	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	28 $\frac{3}{4}$	29 $\frac{3}{4}$	8 x12
	3 $\frac{1}{2}$	18	15 $\frac{1}{2}$	51 $\frac{5}{8}$	54 $\frac{1}{8}$	30 $\frac{1}{8}$	53	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	28 $\frac{3}{4}$	29 $\frac{3}{4}$	8 x12
	4	18 $\frac{1}{4}$	15 $\frac{3}{4}$	48 $\frac{5}{8}$	51 $\frac{1}{8}$	30 $\frac{7}{8}$	49 $\frac{5}{8}$	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	30 $\frac{1}{4}$	31 $\frac{5}{8}$	8 x12
	4 $\frac{1}{2}$	18 $\frac{1}{4}$	15 $\frac{3}{4}$	52 $\frac{1}{2}$	54 $\frac{7}{8}$	30 $\frac{7}{8}$	53 $\frac{5}{8}$	16 $\frac{1}{8}$	11	5 $\frac{1}{2}$	10 $\frac{1}{2}$	30 $\frac{1}{4}$	31 $\frac{5}{8}$	8 x12
	5	20	17 $\frac{3}{8}$	53 $\frac{1}{2}$	55 $\frac{3}{4}$	32 $\frac{3}{4}$	53 $\frac{3}{8}$	24 $\frac{1}{8}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	30 $\frac{3}{4}$	33 $\frac{1}{2}$	34 $\frac{3}{4}$	8 $\frac{1}{2}$ x13 $\frac{1}{2}$
	5 $\frac{1}{2}$	20	17 $\frac{3}{8}$	58	60 $\frac{1}{4}$	32 $\frac{3}{4}$	57 $\frac{5}{8}$	24 $\frac{1}{8}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	30 $\frac{3}{4}$	33 $\frac{1}{2}$	34 $\frac{3}{4}$	8 $\frac{1}{2}$ x13 $\frac{1}{2}$
	6	20	17 $\frac{1}{2}$	54 $\frac{1}{2}$	56 $\frac{3}{4}$	33 $\frac{1}{4}$	54 $\frac{1}{4}$	24 $\frac{1}{8}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	30 $\frac{3}{4}$	36 $\frac{1}{2}$	38	8 $\frac{1}{2}$ x13 $\frac{1}{2}$
	6A	20	17 $\frac{1}{2}$	59	61 $\frac{1}{4}$	33 $\frac{1}{4}$	58 $\frac{5}{8}$	24 $\frac{1}{8}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	30 $\frac{3}{4}$	36 $\frac{1}{2}$	38	8 $\frac{1}{2}$ x13 $\frac{1}{2}$
	6 $\frac{1}{2}$	23 $\frac{3}{4}$	21 $\frac{1}{8}$	61 $\frac{1}{4}$	63 $\frac{1}{2}$	36 $\frac{1}{4}$	59	45	7	7	45 $\frac{1}{4}$	39 $\frac{3}{8}$	42	9 $\frac{1}{4}$ x15
	6 $\frac{1}{2}$ A	23 $\frac{3}{4}$	21 $\frac{1}{8}$	66	68 $\frac{3}{8}$	36 $\frac{1}{4}$	63 $\frac{5}{8}$	45	7	7	45 $\frac{1}{4}$	39 $\frac{3}{8}$	42	9 $\frac{1}{4}$ x15
	7	23 $\frac{1}{2}$	21 $\frac{1}{8}$	61	63 $\frac{3}{8}$	36 $\frac{1}{4}$	59	56 $\frac{1}{2}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	56 $\frac{1}{2}$	41	44	9 $\frac{1}{4}$ x15
	7 $\frac{1}{2}$	23 $\frac{1}{2}$	21 $\frac{1}{8}$	65 $\frac{7}{8}$	68 $\frac{1}{4}$	36 $\frac{1}{4}$	63 $\frac{3}{4}$	56 $\frac{1}{2}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	56 $\frac{1}{2}$	41	44	9 $\frac{1}{4}$ x15
	8	25	22 $\frac{5}{8}$	64 $\frac{3}{8}$	63 $\frac{1}{2}$	37 $\frac{3}{8}$	61 $\frac{7}{8}$	68 $\frac{7}{8}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	68 $\frac{7}{8}$	46 $\frac{1}{8}$	49 $\frac{5}{8}$	9 $\frac{1}{2}$ x16
	8 $\frac{1}{2}$	25	22 $\frac{5}{8}$	69 $\frac{1}{2}$	71 $\frac{5}{8}$	37 $\frac{3}{8}$	67 $\frac{1}{4}$	68 $\frac{7}{8}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	68 $\frac{7}{8}$	46 $\frac{1}{8}$	49 $\frac{5}{8}$	9 $\frac{1}{2}$ x16
	9	25 $\frac{1}{8}$	22 $\frac{3}{4}$	64 $\frac{7}{8}$	67 $\frac{1}{8}$	37 $\frac{3}{8}$	61 $\frac{7}{8}$	68 $\frac{7}{8}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	68 $\frac{7}{8}$	48 $\frac{3}{4}$	52 $\frac{1}{4}$	9 $\frac{1}{2}$ x16
	9 $\frac{1}{2}$	25 $\frac{1}{8}$	22 $\frac{3}{4}$	70	72 $\frac{1}{4}$	37 $\frac{3}{8}$	67	68 $\frac{7}{8}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	68 $\frac{7}{8}$	48 $\frac{3}{4}$	52 $\frac{1}{4}$	9 $\frac{1}{2}$ x16

NOTE:—For Prices and Capacities see Repair Section Pages 45-46

# ROYAL SQUARE SECTIONAL BOILERS

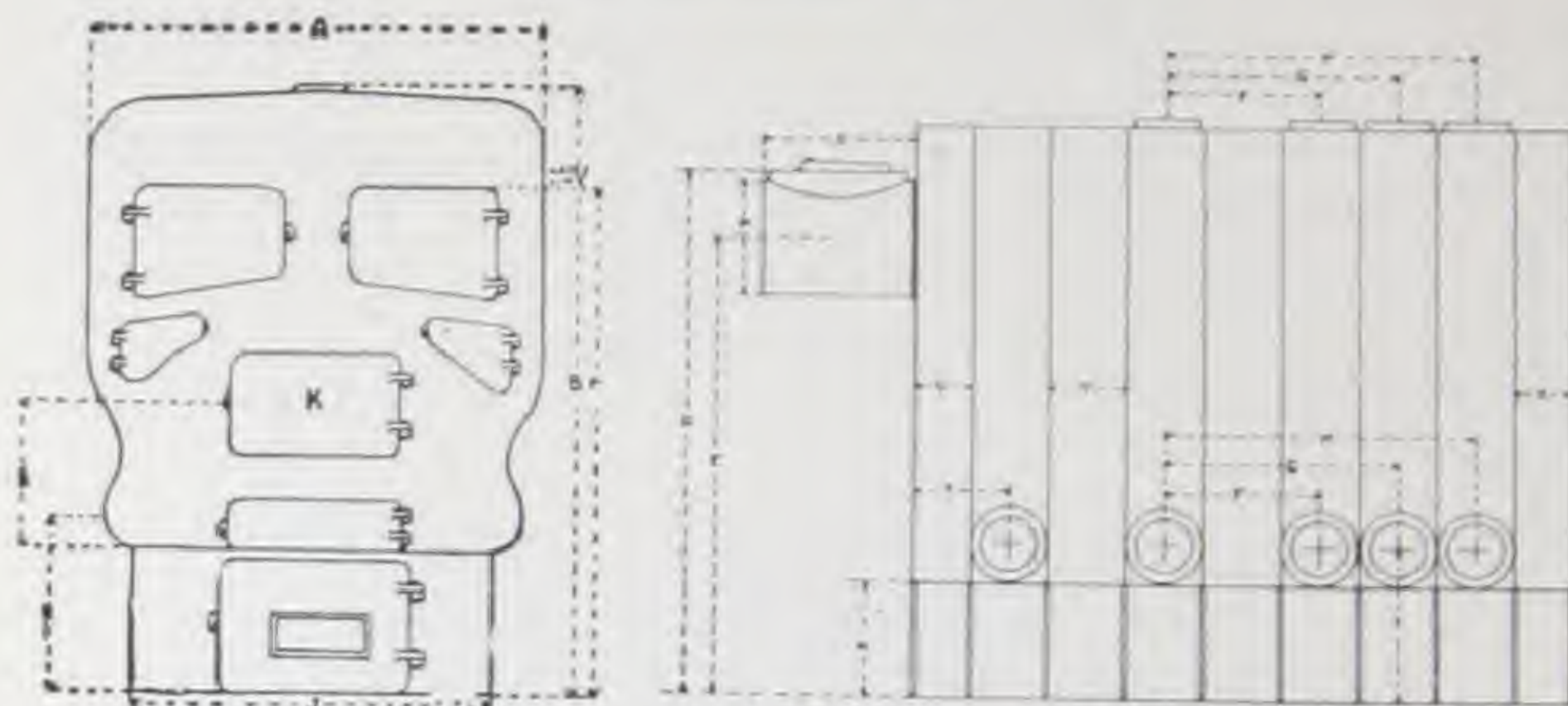


TABLE OF MEASUREMENT AS INDICATED ON SKETCH ABOVE

	19-inch Boilers		25-inch Boilers		36-inch Boilers		48-inch Boilers	
	Steam	Water	Steam	Water	Steam	Water	Steam	Water
A	33 1/2	33 1/2	36	36 1/2	56	56	67	67
B	51 1/2	51 1/2	57 1/2	57 1/2	71	71	81	81
C	12 1/2	12 1/2	14	14	14	14	19 1/2	19 1/2
D	45	45	49	49	59	59	67	67
E	39	39	42	42	52	52	58 1/2	58 1/2
F	13 1/2	13 1/2	14	14	17	17	21	21
G	19 1/2	19 1/2	21	21	25 1/2	25 1/2	31 1/2	31 1/2
H	27	27	28	28	34	34	42	42
I	16 1/2	16 1/2	16 1/2	16 1/2	19	19	20 1/2	20 1/2
J	22	22	28	28	42	42	55	55
K	8 1/2x13	8 1/2x13	10x16	10x16	13x20	13x20	11x17	11x17
M	43 1/4	43 1/4	47 1/4	47 1/4	57 1/2	57 1/2	68	68
N	12 1/2	12 1/2	12 1/2	12 1/2	14 1/2	14 1/2	14 1/2	14 1/2
P	9	9	11 1/2	11 1/2	11	11	15 1/2	15 1/2
S	12 1/2	12 1/2	14 1/2	14 1/2	16 1/2	16 1/2	17	17
T	8 1/2	8 1/2	9 1/2	9 1/2	12	12	15	15
U	5 3/4	5 3/4	5 3/4	5 3/4	6 1/2	6 1/2	....	....
V	6 1/2	6 1/2	6 3/4	6 3/4	8 1/4	8 3/4	....	....
X	5 3/4	5 3/4	5 3/4	5 3/4	7 1/2	7 1/2	....	....

NOTE:—For Prices and Capacities see Boiler Section, Pages 19-24.

**ROYAL**  
**SQUARE SECTIONAL BOILERS**  
**STANDARD TAPPINGS AND LOCATION**

STEAM						WATER							
Size of Boilers	Supply		Returns	Size of Boilers	Supply		Returns						
	No.	Size Ins.			No.	Size Ins.							
S-19-5	2	3	2-4	2	3	4	W-19-5	2	3	2-4	2	3	4
S-19-6	2	3	2-4	2	3	4	W-19-6	2	3	2-4	2	3	4
S-19-7	2	3	2-5	2	3	5	W-19-7	2	3	2-5	2	3	5
S-25-5	2	4	2-4	2	4	4	W-25-5	2	4	2-4	2	4	4
S-25-6	2	4	2-4	2	4	4	W-25-6	2	4	2-4	2	4	4
S-25-7	2	4	2-5	2	4	5	W-25-7	2	4	2-5	2	4	5
S-25-8	2	4	3-6	2	4	6	W-25-8	2	4	3-6	2	4	6
S-36-5	2	5	2-4	2	5	4	W-36-5	2	5	2-4	2	5	4
S-36-6	2	5	2-5	2	5	5	W-36-6	2	5	2-4	2	5	4
S-36-7	3	5	2-4-6	2	5	4	W-36-7	3	5	2-4-6	4	5	4-6
S-36-8	3	5	2-5-7	2	5	5	W-36-8	3	5	2-4-7	4	5	4-7
S-36-9	3	5	2-5-8	2	5	5	W-36-9	4	5	2-4-6-8	4	5	2-6
S-36-10	3	5	2-5-8	2	5	5	W-36-10	4	5	2-4-6-8	4	5	2-6
S-36-11	3	5	3-6-9	2	5	6	W-36-11	4	5	2-5-8-10	4	5	5-8
S-36-12	3	5	3-6-9	2	5	6	W-36-12	4	5	2-5-8-10	4	5	5-8
S-36-13	3	5	4-7-10	2	5	7	W-36-13	4	5	2-5-8-11	4	5	5-8

In 19, 25 and 36 in. Boilers, Returns are placed one on each side of same section.

S-48-6	2	6	2-4	..	..	....	W-48-6	2	6	2-4	2	6	2-4
S-47-7	3	6	2-4-6	..	..	....	W-48-7	2	6	3-5	2	6	3-5
S-48-8	3	6	2-4-6	..	..	....	W-48-8	3	6	2-4-6	3	6	2-4-6
S-48-9	3	6	2-5-8	..	..	....	W-48-9	3	6	2-5-8	3	6	2-5-8
S-48-10	3	6	2-5-8	..	..	....	W-48-10	3	6	2-5-8	3	6	2-5-8

Return Inlets in Back.

36 inch have 2-4"

19 inch have 2-2"

25 " " 2-2 1/2"

NOTE:—For Prices and Capacities, see Boiler Section Pages 19-24.

# IMPERIAL RADIATOR COMPANY LIMITED

## ROYAL SMOKELESS WATER TUBE BOILERS All Measurements Taken From Floor SIDE VIEW MEASUREMENTS

		33"	40"	54"
A	Length over all 11 Section Boiler.....	84"	108"	148"
B	Length of Ashpit for 11 Sectional Boiler.....	69"	79"	112"
C	Distance from floor to top of Steam Separator, 54" only.....	.....	.....	108"
D	Distance from Centre of Side Header to Bottom of Steam Separator.....	.....	50½"	59½"
E	Height from floor to Centre of Smoke Collar..	65"	70"	70"
F	Height from floor to Top of Tee.....	90"	.....	.....
G	Distance from floor to Top of Grates, 54" only	.....	.....	15"
H	Distance from Centre to Centre of Sections...	6½"	7½"	10½"
I	Width of Section.....	6"	7"	10"
J	Width of Back Section, 54" only.....	.....	.....	8"
K	Depth of Smoke Box.....	8"	10"	12"
L	Depth of Smoke Collar.....	4"	4"	3"
M	Diameter of Smoke Collar.....	18 & 21"	21 & 24"	24"
N	Diameter of Equalizer Pipe.....	3"	4"	.....
O	Depth of Ashpit below Floor.....	8"	10"	12"
P	Length of Connection to Steam Separator, 54" only.....	.....	.....	17½"
Q	Size of Steam outlet from Steam Separator No. 558-550-10, No. 549-548-8.....	.....	.....	10" & 8"
R	Size of Tapping for Drip Pipe Connection, 54" only.....	.....	.....	5"
S	Distance from Rear of Side Header to Centre of Steam Separator, 54" only.....	.....	.....	27½"

## FRONT VIEW MEASUREMENTS

		33"	40"	54"
AA	Width of Sections Across Top.....	46½"	59"	78"
BB	Width of Boiler Across Lower Front Frame...	40"	52"	62½"
CC	Width of Boiler across Side Header.....	60"	70"	87"
DD	Width of Boiler over all.....	68"	78"	97"
EE	Height from Floor to Top of Header.....	90½"	96½"	105"
FF	Height from Floor to Top of Section.....	78½"	82"	89"
GG	Height of Water line from Floor.....	63"	68"	70"
HH	Height of Ashpit sides.....	15"	13½"	13"
II	Projection of Front Frame below Bottom of Ashpit Base, 54" only.....	.....	.....	2"
JJ	Distance to Centre of Side Header, 54" only..	.....	.....	12½"
KK	Size of Cleanout Doors "Side".....	14 x 15	20 x 18½	13 x 19
LL	Size of Cleanout Doors "Inside," 54" only....	.....	.....	6 x 19
MM	Size of Cleanout Doors, "Centre".....	12½ x 15	13½ x 18½	15 x 18
NN	Size of Feed Doors.....	21½ x 15½	21½ x 15	21 x 13
OO	Size of Stoking Doors.....	13 x 3½	15 x 4	17 x 4
PP	Size of Lower Feed Doors.....	22 x 12	22 x 12	19 x 12
QQ	Size of Ashpit Doors.....	22½ x 12	29 x 13	18 x 11

NOTE.—For Prices and Capacities see Boiler's Section Pages 25, 26, 27.

## INSTRUCTIONS FOR ORDERING BOILERS AND BOILER REPAIRS

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State plainly the catalogue name and number of boiler.

When ordering repair parts for any boilers, give the size, number and catalogue name which is on the front of the boiler. Also give the factory or serial number which is to be found on the brass plate on Fire doors. It is well to mention all letters or numbers which may appear on part required. In case it is impossible to give any of the above information, send a sketch, having dimensions marked on it, and a rough detailed description of parts wanted. Especially mention whether the boiler is round or square. If grate bars are required, always number from the front. When ordering repair sections for round boiler, mention which one numbering from the firepot, for square boiler, from the front and state whether same has any tapped openings and the size of the tapping.

**KING  
HOT WATER BOILERS**



**No. 6 King Boiler with High Base**

NOTE—This type of Boiler Discontinued.  
Repair Parts only Obtainable.

# KING HOT WATER BOILER LISTS, DIMENSIONS AND CAPACITIES

Size	Net Rating in Sq. Ft. Direct Radiation	Gross Rating in Square Feet	LIST PRICES		Height to Top of Dome		Diameter in Inches of				Depth of Fire Pot	Average Fire Pot Area Sq. Ft.	Average Grate Area Sq. Ft.	No. of Mains Flow and Return	Size of Coal
			High	Low	High	Low	Smoke P.	Base Ring	Fire Pot Top	Fire Pot Bottom					
1	250	375	1302.00	1268.00	51 3/8	45 1/8	8	26 1/8	17 1/8	19	16 3/4	182	197	4	2 Stove
2	365	550	360.00	320.00	55 1/8	49	8	26 1/8	17 1/8	19	16 3/4	182	197	4	2 Stove
2 1/2	420	625	395.00	356.00	59 3/4	53	8	26 1/8	17 1/8	19	16 3/4	182	197	4	2 Stove
3	500	750	425.00	382.00	55 3/4	49	8	30	19 3/4	21 1/4	16 3/4	223	246	4	2 Stove
3 1/2	585	875	465.00	425.00	59 1/8	53	8	30	19 3/4	21 1/4	16 3/4	223	246	4	2 Stove
4	685	1,025	505.00	462.00	56 1/2	49 5/8	8	31	22 1/8	24	17 1/4	295	314	4	2 Stove
4 1/2	750	1,125	545.00	498.00	60 3/8	53 5/8	8	31	22 1/8	24	17 1/4	295	314	4	2 Stove
5	835	1,250	603.00	550.00	61	53 3/8	10	35	24 1/2	26	18 1/2	348	369	6	2 " or Egg
5 1/2	935	1,400	651.00	590.00	64 5/8	57 5/8	10	35	24 1/2	26	18 1/2	348	369	6	2 " or Egg
6	1,000	1,500	700.00	654.00	60 3/4	54 1/4	10	37 1/2	27	28 1/2	18 3/4	420	443	7	2 Egg
6a	1,100	1,650	746.00	706.00	65 1/4	55 5/8	10	37 1/2	27	28 1/2	18 3/4	420	443	7	2 Egg
6 1/2	1,250	1,875	842.00	775.00	64 3/4	59	12	40	29 1/2	31	19 1/2	500	524	8	2 Egg
6 3/4	1,350	2,025	905.00	840.00	69 3/8	63 3/8	12	40	29 1/2	31	19 1/2	500	524	8	2 Egg
7	1,500	2,250	950.00	880.00	65 3/8	59	12	42 1/2	32	33 1/2	19 1/2	585	612	11	2 Egg
7 1/2	1,765	2,650	1,017.00	945.00	70	63 3/4	12	42 1/2	32	33 1/2	19 1/2	585	612	11	2 Egg
8	2,000	3,000	1,160.00	1,052.00	68 3/8	61 3/8	12	46 3/4	36 3/4	38 1/4	19 3/8	767	798	13	2 Egg
8 1/2	2,300	3,450	1,326.00	1,210.00	73 1/4	67 3/4	12	46 3/4	36 3/4	38 1/4	19 3/8	767	798	13	2 Egg
9	2,665	4,000	1,396.00	1,300.00	68	61 7/8	12	49 1/4	39 1/4	40 3/4	19 3/8	873	906	13	2 Egg
9 1/2	3,000	4,500	1,600.00	1,500.00	73	67	12	49 1/4	39 1/4	40 3/4	19 3/8	873	906	13	2 Egg

Note:—King Boilers will carry the ratings shown above and the mains in addition. No extra charge for Special Headers. All half sizes have five sections above fire pot.  
 Arranged for pipe coil at either side of heater for water for domestic purposes.  
 When ordering repairs for King Boilers always refer to Serial number on Fire Door and letter on part to be replaced. For measurements see Roughing-in Section Page 40.

**ROYAL**  
**ROUND HOT WATER BOILER**  
**PUSH NIPPLE CONSTRUCTION**



**No. 4-22-W. Royal Boiler with Low Base**

NOTE—This type of Boiler Discontinued,  
Repair Parts only Obtainable.

# ROYAL

## ROUND HOT WATER BOILERS LISTS, DIMENSIONS AND CAPACITIES

Size No.	Net Rating in Square Ft. Direct Rad'n	List Prices		Height to Top Outlet Inches		Diameter in Inches—of			Depth of Fire Pot Inches	Outlets and Inlets 2 each Size in Ins.	Size of Coal
		High Base	Low Base	High Base	Low Base	Fire Pot	Smoke Pipe	Grate			
3-19-w	250	302.00	268.00	48 $\frac{3}{4}$	41 $\frac{3}{4}$	19	8	19	16 $\frac{3}{4}$	2-2 $\frac{1}{2}$	Stove
4-19-w	365	360.00	320.00	52 $\frac{1}{2}$	45 $\frac{1}{2}$	19	8	19	16 $\frac{3}{4}$	2-2 $\frac{1}{2}$	Stove
5-19-w	420	395.00	356.00	56 $\frac{1}{4}$	49 $\frac{1}{2}$	19	8	19	16 $\frac{3}{4}$	2-2 $\frac{1}{2}$	Stove
4-22-w	500	425.00	382.00	52 $\frac{3}{4}$	46	22	9	22	16 $\frac{3}{4}$	2-3	Stove
5-22-w	585	465.00	425.00	56 $\frac{3}{4}$	50	22	9	22	16 $\frac{3}{4}$	2-3	Stove
4-25-w	685	505.00	462.00	54 $\frac{1}{4}$	47 $\frac{1}{2}$	25	9	25	17 $\frac{1}{4}$	2-3 $\frac{1}{2}$	Stove
5-25-w	750	545.00	498.00	58 $\frac{1}{4}$	51 $\frac{1}{2}$	25	9	25	17 $\frac{1}{4}$	2-3 $\frac{1}{2}$	Stove
3-28-w	935	651.00	590.00	54 $\frac{1}{2}$	47 $\frac{1}{2}$	28	10	28	18 $\frac{3}{4}$	2-4	Stv. or Egg
4-28-w	1000	700.00	654.00	58 $\frac{3}{4}$	51 $\frac{1}{2}$	28	10	28	18 $\frac{3}{4}$	2-4	Egg
5-28-w	1100	746.00	706.00	63	55 $\frac{3}{4}$	28	10	28	18 $\frac{3}{4}$	2-4	Egg
4-31-w	1250	842.00	775.00	60 $\frac{1}{2}$	53 $\frac{1}{4}$	31	10	31	19 $\frac{1}{2}$	2-5	Egg
5-31-w	1350	905.00	840.00	65 $\frac{3}{4}$	58 $\frac{3}{4}$	31	10	31	19 $\frac{1}{2}$	2-5	Egg
4-34-w	1500	950.00	880.00	66 $\frac{3}{4}$	58 $\frac{3}{4}$	34	12	34	19 $\frac{1}{2}$	2-5	Egg
5-34-w	1765	1017.00	945.00	72	64	34	12	34	19 $\frac{1}{2}$	2-5	Egg

These Boilers are of the Push Nipple Construction.

NOTE:—Royal Boilers will carry the ratings shown above and the mains in addition. Headers will be supplied when necessary.

This Boiler is replaced by "New King" pattern.

For Measurements, see Page 49.

# ROYAL ROUND HOT WATER BOILERS

NOW OBSOLETE  
Repairs only obtainable

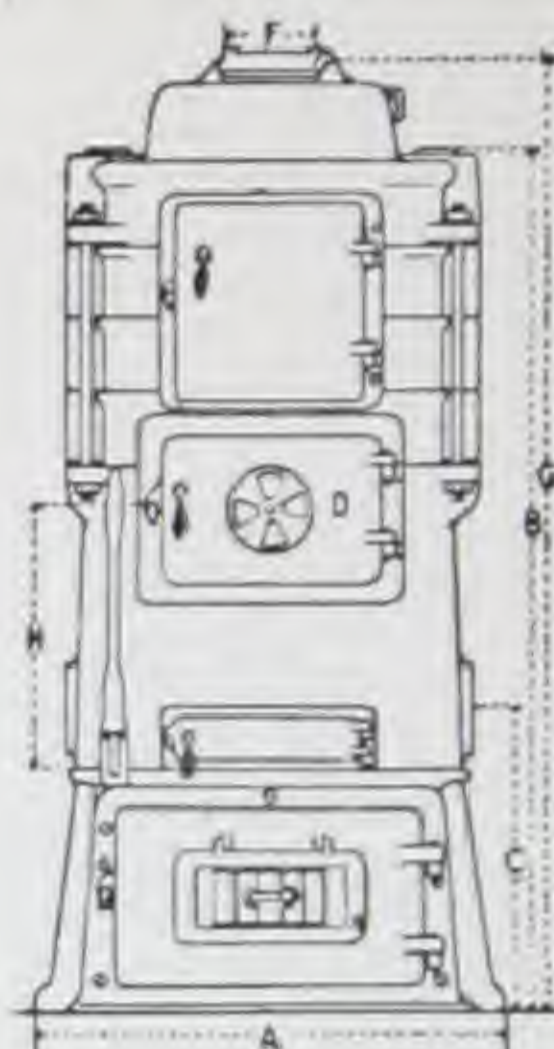


Table of Measurements as indicated on Sketch above.

Size	A	B	C	D	G	H
3-19-W .....	28	41 $\frac{1}{2}$	15 $\frac{3}{4}$	8 x 12	48 $\frac{1}{2}$	15
4-19-W .....	28	45 $\frac{1}{2}$	15 $\frac{3}{4}$	8 x 12	52 $\frac{1}{2}$	15
5-19-W .....	28	49 $\frac{1}{2}$	15 $\frac{3}{4}$	8 x 12	56 $\frac{1}{2}$	15
4-22-W .....	30	46	15 $\frac{1}{4}$	8 x 12	53	15
5-22-W .....	30	50	15 $\frac{1}{4}$	8 x 12	57	15
4-25-W .....	32	47 $\frac{1}{2}$	15 $\frac{3}{4}$	8 x 12 $\frac{1}{4}$	55	15 $\frac{5}{8}$
5-25-W .....	32	51 $\frac{1}{2}$	15 $\frac{3}{4}$	8 x 12 $\frac{1}{4}$	59 $\frac{1}{2}$	15 $\frac{5}{8}$
3-28-W .....	34 $\frac{3}{4}$	47 $\frac{1}{4}$	17 $\frac{1}{4}$	9 x 14	55 $\frac{3}{4}$	16 $\frac{1}{2}$
4-28-W .....	34 $\frac{3}{4}$	51 $\frac{1}{2}$	17 $\frac{1}{4}$	9 x 14	60	16 $\frac{1}{2}$
5-28-W .....	34 $\frac{3}{4}$	55 $\frac{3}{4}$	17 $\frac{1}{4}$	9 x 14	64 $\frac{1}{4}$	16 $\frac{1}{2}$
4-31-W .....	37	53 $\frac{1}{2}$	19 $\frac{1}{2}$	9 $\frac{1}{2}$ x 15 $\frac{1}{2}$	62	17
5-31-W .....	37	58 $\frac{3}{4}$	19 $\frac{1}{2}$	9 $\frac{1}{2}$ x 15 $\frac{1}{2}$	67	17
4-34-W .....	40	58 $\frac{3}{4}$	20	9 $\frac{1}{2}$ x 15 $\frac{1}{2}$	68	18
5-34-W .....	40	60	20	9 $\frac{1}{2}$ x 15 $\frac{1}{2}$	73 $\frac{1}{2}$	18

NOTE:—The above measurements are for Low Base Boilers. To arrive at height of High Base Boilers add as follows:—

19 in. Boilers, 6 $\frac{3}{4}$  in.  
25 in. Boilers, 6 $\frac{3}{4}$  in.  
31 in. Boilers, 7 in.

22 in. Boilers, 6 $\frac{3}{4}$  in.  
28 in. Boilers, 7 $\frac{1}{4}$  in.  
34 in. Boilers, 8 in.

KING  
HOT WATER BOILERS  
TABLE OF MEASUREMENTS OF TWIN CONNECTIONS

No.	No. and Size of Outlets, in.		Valves		Diameter of Flanges in.	Length of Headers		Inside dia. Hdrs. in.	Centre to Centre of Flange on Hdr. in.	Centre to Centre of Flanges Flow and Return Headers.	Floor to Centre of End Opening				Floor to Top of Headers				Space Occupied		Distances between Boiler Bases, etc.	Size of Expansion Pipe in.
	No.	Size in.	Flow in.	Return in.		Flow					Return		Flow		Return		Width in.	Depth in.				
						HB	LB				HB	LB	HB	LB	HB	LB						
2	2	4	4	4	6	44	44	4	34	33 3/4	55 1/2	48 3/8	22 3/8	15 3/4	57 1/2	50 1/4	24 3/8	18 3/4	58	50	6	1
2 1/2	2 1/2	4	4	4	6	44	44	4	34	37 3/8	59 1/2	52 1/2	22 3/8	15 3/4	61 1/2	54 1/4	24 3/8	18 3/4	58	50	6	1
3	3	4	4	4	6	58 1/4	58 1/4	4	41	33 3/4	54 3/4	48	22 3/8	15 1/2	57 1/2	50 5/8	24 3/8	18	71	54	11	1
3 1/2	3 1/2	4	4	4	6	58 1/4	58 1/4	4	41	37 3/8	58 3/4	52	22 3/8	15 1/2	61 1/4	54 1/4	24 3/8	18	71	54	11	1
4	4	4	4	4	6	58 3/4	58 3/4	4	41	33 3/4	55 5/8	48 3/8	22 3/8	15 3/4	58 1/8	51 1/4	24 3/8	18 1/4	73 1/2	56 1/2	8 1/2	1
4 1/2	4 1/2	4	4	4	6	58 3/4	58 3/4	4	41	37 3/8	59 1/2	52 1/2	22 3/8	15 3/4	62	55 3/8	24 3/8	18 1/4	73 1/2	56 1/2	8 1/2	1
5	5	5	4	4	10	72 1/4	72 1/4	5	45 1/2	37	82 7/8	54 3/4	24 5/8	17 3/8	65 7/8	57 3/4	27 5/8	20 3/8	80	60	10 3/8	1
5 1/2	5 1/2	5	4	4	10	72 1/4	72 1/4	5	45 1/2	41 3/8	66	58 3/4	24 5/8	17 3/8	69	61 3/4	27 5/8	20 3/8	80	60	10 3/8	1
6	6	5	4	4	10	72 1/4	72 1/4	5	45 1/2	37 1/2	61 3/8	55 3/4	24	17 1/2	64 3/4	58 3/4	27	20 1/2	82 1/2	63	8 1/2	1 1/2
6 1/4	6 1/4	5	4	4	10	72 1/4	72 1/4	5	45 1/2	42 1/4	65 3/8	59 3/4	24	17 1/2	68 3/4	62 1/4	27	20 1/2	82 1/2	63	8 1/2	1 1/2
6 1/2	6 1/2	6	4	4	11	86 1/4	86 1/4	6	54	39 1/2	70 1/2	64 3/4	26 3/8	20 3/8	69 3/8	63 1/4	29 5/8	23 5/8	98	67	10	1 1/2
6 3/4	6 3/4	6	4	4	11	86 1/4	86 1/4	6	54	44 1/2	75 1/2	69 3/4	26 3/8	20 3/8	74	68 3/8	29 5/8	23 5/8	98	67	10	1 1/2
7	7	6	4	4	11	100 1/2	100 1/2	6	57	40 1/2	85 3/8	59 3/4	26	20 3/8	89 3/8	68 3/8	29 5/8	23 5/8	100	74	12	1 1/2
7 1/2	7 1/2	6	4	4	11	100 1/2	100 1/2	6	57	45 1/2	90 3/8	64 3/4	26	20 3/8	94 3/8	74 3/4	68 3/8	29 5/8	100	74	12	1 1/2
8	8	7	4	4	12 1/2	128 1/4	128 1/4	7	65	42 1/2	98 3/4	62 3/4	27 1/8	21 1/8	102 3/4	81 3/4	31 3/8	25 1/8	128 1/4	83	19	1 1/2
8 1/2	8 1/2	7	4	4	12 1/2	128 1/4	128 1/4	7	65	47 3/4	103 3/4	68 3/4	27 1/8	21 1/8	107 3/4	86 3/4	31 3/8	25 1/8	128 1/4	83	19	1 1/2
9	9	7	4	4	12 1/2	128 3/4	128 3/4	7	88	42 1/2	108 3/4	62 3/4	27 1/8	21 1/8	112 3/4	91 3/4	31 3/8	25 1/8	166 3/4	87	38	1 1/2
9 1/2	9 1/2	7	4	4	12 1/2	128 3/4	128 3/4	7	88	47 3/4	113 3/4	68 3/4	27 1/8	21 1/8	117 3/4	96 3/4	31 3/8	25 1/8	166 3/4	87	38	1 1/2

NOTE:—Space occupied. Width means Distance between outside of Bases. Depth means distance from front of ashpit to back of Return Header.

Standard Centres are as follows:—2 in. Outlets. 7 in. Centres 2 1/2 in. Outlets. 8 1/2 in. Centres  
3 in. Outlets. 10 1/2 in. Centres 3 1/2 in. Outlets. 13 in. Centres  
4 1/2 in. Outlets. 14 in. Centres 5 in. Outlets. 15 in. Centres 6 in. Outlets. 18 in. Centres

Twin, Triple and Quadruple Headers must rest upon supports provided for that purpose.

NOTE:—For Prices and Capacities, see Boiler Section, Pages 45-46. All sizes excepting No. 9 now Obsolete in this type of Boiler.

# NEW KING, KING AND ROYAL ROUND WATER AND STEAM BOILERS

## ARRANGEMENT OF GRATES AND CONNECTING BARS

Size of Boiler	No. of Grates in Set	Left Hand Shake	Right Hand Shake	Connecting Bar	
				Left Hand	Right Hand
1-2	3	3		1	
3	3	3		1	
4	4	4		1	
5	4	2 Back grates	2 Front grates	1 Long	1 Short
6	4	2 Front grates	2 Back grates	1 Short	1 Long
6 1/2	5	3 Front grates	2 Back grates	1 Short	1 Long
7	5	3 Front grates	2 Back grates	1 Short	1 Long
8	6	3 Front grates	3 Back grates	1 Short	1 Long
9	6	3 Front grates	3 Back grates	1 Long	1 Short

NOTE:—Half size Boilers take same grate as next size smaller. Example No. 3 1/2 takes same as No. 3.

No. 4C. take same as No. 4. All A. Boilers are half size.

When ordering grates for repairs:—

Indicate the grate required for Round Boilers by numbering from front to back.

# ROYAL SQUARE STEAM AND WATER BOILERS

## ARRANGEMENT OF GRATES AND CONNECTING BARS

Size of Boiler	No. of Grates	Left Hand Shake	Right Hand Shake	Connecting Bar		Connecting Rod	
				Left Hand	Right Hand	Left Hand	Right Hand
S. or W.							
15-4	3	3		1-3 Link		1 Short	
15-5	4	4		1-4 Link		1 Short	
15-6	5	5		1-5 Link		1 Short	
19-5	4	4		1-4 Link		1 Short	
19-6	5	5		1-5 Link		1 Short	
19-7	6	6		1-6 Link		1 Short	
25-5	4	2	2	1-2 Link	1-2 Link	1 Short	1 Long
25-6	5	3	2	1-3 Link	1-2 Link	1 Short	1 Long
25-7	6	3	3	1-3 Link	1-3 Link	1 Short	1 Long
25-8	7	4	3	1-4 Link	1-3 Link	1 Short	1 Long
36-5	4	2	2	1-2 Link	1-2 Link	1 Short	1 Long
36-6	5	3	2	1-3 Link	1-2 Link	1 Short	1 Long
36-7	6	3	3	1-3 Link	1-3 Link	1 Short	1 Long
36-8	7	4	3	1-4 Link	1-3 Link	1 Short	1 Long
36-9	8	4	4	1-4 Link	1-4 Link	1 Short	1 Long

In square Boilers the grates are all alike for each series.

**RADIATOR  
SECTION**

## IMPERIAL RADIATORS

ONE COLUMN—WATER OR STEAM  
MALLEABLE SCREW NIPPLE CONNECTIONS



### IMPERIAL PATTERN

Plain

### DIMENSIONS

Width of Section.....	4 <sup>3</sup> / <sub>8</sub> Inches
Width of Legs.....	4 <sup>3</sup> / <sub>8</sub> Inches
Distances floor to centre of openings.....	4 <sup>1</sup> / <sub>2</sub> Inches

Made only in Single Connections.

NOTE—For Tapping Schedule and Roughing-in Measurements, see pages 73-78.

# IMPERIAL RADIATORS

## MALLEABLE SCREW NIPPLE CONNECTIONS

### ONE COLUMN

### WATER OR STEAM

### LISTS, CAPACITIES AND DIMENSIONS

Number of Section	Length of Radiator Including Plugs and Bushings	HEATING SURFACE IN SQUARE FEET				
		38 ins. high 3 sqr. ft. per section	32 ins. high 2½ sqr. ft. per section	26 ins. high 2 sqr. ft. per section	23 ins. high 1⅔ sqr. ft. per section	20 ins. high 1½ sqr. ft. per section
2	6	6	5	4	3⅓	3
3	8½	9	7½	6	5	4½
4	11	12	10	8	6⅔	6
5	13½	15	12½	10	8⅓	7½
6	16	18	15	12	10	9
7	18½	21	17½	14	11⅔	10½
8	21	24	20	16	13⅓	12
9	23½	27	22½	18	15	13½
10	26	30	25	20	16⅔	15
11	28½	33	27½	22	18⅓	16½
12	31	36	30	24	20	18
13	33½	39	32½	26	21⅔	19½
14	36	42	35	28	23⅓	21
15	38½	45	37½	30	25	22½
16	41	48	40	32	26⅔	24
17	43½	51	42½	34	28⅓	25½
18	46	54	45	36	30	27
19	48½	57	47½	38	31⅔	28½
20	51	60	50	40	33⅓	30
21	53½	63	52½	42	35	31½
22	56	66	55	44	36⅔	33
23	58½	69	57½	46	38⅓	34
24	61	72	60	48	40	36
25	63½	75	62½	50	41⅔	37½
Price per Square Foot		\$1.00	\$1.10	\$1.20	\$1.26	\$1.36

To find equivalent in 1 inch pipe, multiply square foot surface by 3.

### TAPPINGS, SINGLE CONNECTION ONLY

Length of Radiator is estimated on the basis of 2½ in. for each section plus ½ in. on each end for plugs and bushings.

NOTE:—Schedule of Tappings and Roughing-in Measurements, Pages 73-78.

**IMPERIAL RADIATORS**  
**TWO COLUMN—WATER OR STEAM**  
**MALLEABLE SCREW NIPPLE CONNECTIONS**



**IMPERIAL PATTERN**  
**Plain**

Width of Section .....	7 <sup>1</sup> / <sub>4</sub> Inches
Width of Legs .....	7 <sup>1</sup> / <sub>4</sub> Inches
Distance from Floor to Centre of Openings .....	4 <sup>1</sup> / <sub>2</sub> Inches
Distance between Centres of Twin Connections .....	3 <sup>1</sup> / <sub>4</sub> Inches

Made in Single and Twin Connections

NOTE—For all other dimensions see pages 73-78.

# IMPERIAL RADIATOR COMPANY LIMITED

## IMPERIAL RADIATORS

### MALLEABLE SCREW-NIPPLE CONNECTIONS

#### TWO COLUMN

#### WATER OR STEAM

#### LISTS, CAPACITIES AND DIMENSIONS

Number of Sections	Length of Radiator In- cluding Plugs and Bushings	HEATING SURFACE IN SQUARE FEET						
		45 in. high 5 sq. ft. per section	38 in. high 4 sq. ft. per section	32 in. high 3 $\frac{1}{3}$ sq. ft. per section	30 in. high 3 sq. ft. per section	26 in. high 2 $\frac{2}{3}$ sq. ft. per section	23 in. high 2 $\frac{1}{3}$ sq. ft. per section	20 in. high 2 sq. ft. per section
2	6	10	8	6 $\frac{2}{3}$	6	5 $\frac{1}{3}$	4 $\frac{2}{3}$	4
3	8 $\frac{1}{2}$	15	12	10	9	8	7	6
4	11	20	16	13 $\frac{1}{3}$	12	10 $\frac{2}{3}$	9 $\frac{1}{3}$	8
5	13 $\frac{1}{2}$	25	20	16 $\frac{2}{3}$	15	13 $\frac{1}{3}$	11 $\frac{2}{3}$	10
6	16	30	24	20	18	16	14	12
7	18 $\frac{1}{2}$	35	28	23 $\frac{1}{3}$	21	18 $\frac{2}{3}$	16 $\frac{1}{3}$	14
8	21	40	32	26 $\frac{2}{3}$	24	21 $\frac{1}{3}$	18 $\frac{2}{3}$	16
9	23 $\frac{1}{2}$	45	36	30	27	24	21	18
10	26	50	40	33 $\frac{1}{3}$	30	26 $\frac{2}{3}$	23 $\frac{1}{3}$	20
11	28 $\frac{1}{2}$	55	44	36 $\frac{2}{3}$	33	29 $\frac{1}{3}$	25 $\frac{2}{3}$	22
12	31	60	48	40	36	32	28	24
13	33 $\frac{1}{2}$	65	52	43 $\frac{1}{3}$	39	34 $\frac{2}{3}$	30 $\frac{1}{3}$	26
14	36	70	56	46 $\frac{2}{3}$	42	37 $\frac{1}{3}$	32 $\frac{2}{3}$	28
15	38 $\frac{1}{2}$	75	60	50	45	40	35	30
16	41	80	64	53 $\frac{1}{3}$	48	42 $\frac{2}{3}$	37 $\frac{1}{3}$	32
17	43 $\frac{1}{2}$	85	68	56 $\frac{2}{3}$	51	45 $\frac{1}{3}$	39 $\frac{2}{3}$	34
18	46	90	72	60	54	48	42	36
19	48 $\frac{1}{2}$	95	76	63 $\frac{1}{3}$	57	50 $\frac{2}{3}$	44 $\frac{1}{3}$	38
20	51	100	80	66 $\frac{2}{3}$	60	53 $\frac{1}{3}$	46 $\frac{2}{3}$	40
21	53 $\frac{1}{2}$	105	84	70	63	56	49	42
22	56	110	88	73 $\frac{1}{3}$	66	58 $\frac{2}{3}$	51 $\frac{1}{3}$	44
23	58 $\frac{1}{2}$	115	92	76 $\frac{2}{3}$	69	61 $\frac{1}{3}$	53 $\frac{2}{3}$	46
24	61	120	96	80	72	64	56	48
25	63 $\frac{1}{2}$	125	100	83 $\frac{1}{3}$	75	66 $\frac{2}{3}$	58 $\frac{1}{3}$	50
Price per Sq. Foot		\$1.00	\$1.00	\$1.10	\$1.15	\$1.20	\$1.26	\$1.36

To find equivalent in 1 inch pipe, multiply square foot surface by 3.

Length of Radiator is estimated on the basis of 2 $\frac{1}{2}$  in. for every section plus  $\frac{1}{2}$  in. on each end for plugs and bushings.

NOTE:—Schedule of Tappings and Roughing-in Measurements, see pages 73-78.

**IMPERIAL RADIATORS**  
**THREE COLUMN—WATER OR STEAM**  
**MALLEABLE SCREW NIPPLE CONNECTIONS**



**IMPERIAL PATTERN**  
**Plain**

Width of Section.....	9	Inches
Width of Legs.....	9	Inches
Distance from floor to centre of opening.....	4 1/2	Inches
Distance between centres of twin connections.....	3 1/4	Inches

Made in single or twin connections.

NOTE—For all other Dimensions see pages 73-78.

# IMPERIAL RADIATORS

## MALLEABLE SCREW NIPPLE CONNECTIONS

### THREE COLUMN

### WATER OR STEAM

### LISTS, CAPACITIES AND DIMENSIONS

Number of sections	Length of Radiator in- clud'g Plugs and Bushing	HEATING SURFACE IN SQUARE FEET.					
		44 in. high 6 sq. ft. per section.	38 in. high 5 sq. ft. per section.	32 in. high 4½ sq. ft. per section.	26 in. high 3¾ sq. ft. per section.	22 in. high 3 sq. ft. per section.	18 in. high 2¼ sq. ft. per section.
2	6	12	10	9	7½	6	4½
3	8½	18	15	13½	11¼	9	6¾
4	11	24	20	18	15	12	9
5	13½	30	25	22½	18¾	15	11¼
6	16	36	30	27	22½	18	13½
7	18½	42	35	31½	26¼	21	15¾
8	21	48	40	36	30	24	18
9	23½	54	45	40½	33¾	27	20¼
10	26	60	50	45	37½	30	22½
11	28½	66	55	49½	41¼	33	24¾
12	31	72	60	54	45	36	27
13	33½	78	65	58½	48¾	39	29¼
14	36	84	70	63	52½	42	31½
15	38½	90	75	67½	56¼	45	33¾
16	41	96	80	72	60	48	36
17	43½	102	85	76½	63¾	51	38¼
18	46	108	90	81	67½	54	40½
19	48½	114	95	85½	71¼	57	42¾
20	51	120	100	90	75	60	45
21	53½	126	105	94½	78¾	63	47¼
22	56	132	110	99	82½	66	49½
23	58½	138	115	103½	86¼	69	51¾
24	61	144	120	108	90	72	54
25	63½	150	125	112½	93¾	75	56¼
Price per Sq. Foot		\$1.00	\$1.00	\$1.10	\$1.20	\$1.30	\$1.40

To find equivalent in 1 inch pipe, multiply square foot surface by 3.

Length of Radiator is estimated on the basis of 2½ in. for each section plus ½ in. on each end for plugs and bushings.

NOTE:—Schedule of Tappings and Roughing-in Measurements, pages 73-78.

**IMPERIAL RADIATORS**  
**FOUR COLUMN—WATER OR STEAM**  
**MALLEABLE SCREW NIPPLE CONNECTIONS**



**IMPERIAL PATTERN**  
**Plain**

Width of Section .....	11 ½ Inches
Width of Legs .....	11 ½ Inches
Distance from floor to centre of openings .....	4 ½ Inches
Distance between centres of twin connections .....	3 ¼ Inches

Made in single or twin connections.

NOTE—For all other Dimensions see pages 73-78.

# IMPERIAL RADIATOR COMPANY LIMITED

## IMPERIAL RADIATORS

MALLEABLE SCREW NIPPLE CONNECTIONS

FOUR COLUMN

WATER OR STEAM

PLAIN ONLY

### DIMENSIONS AND CAPACITIES

Number of Sections	Length of Radiator Including plugs and Bushing	HEATING SURFACE IN SQUARE FEET					
		45" high 10 sq. feet per Section	38" high 8 sq. feet per Section	32" high 6 1/2 sq. feet per Section	26" high 5 sq. feet per Section	22" high 4 sq. feet per Section	18" high 3 sq. feet per Section
2	7	20	16	13	10	8	6
3	10	30	24	19 1/2	15	12	9
4	13	40	32	26	20	16	12
5	16	50	40	32 1/2	25	20	15
6	19	60	48	39	30	24	18
7	22	70	56	45 1/2	35	28	21
8	25	80	64	52	40	32	24
9	28	90	72	58 1/2	45	36	27
10	31	100	80	65	50	40	30
11	34	110	88	71 1/2	55	44	33
12	37	120	96	78	60	48	36
13	40	130	104	84 1/2	65	52	39
14	43	140	112	91	70	56	42
15	46	150	120	97 1/2	75	60	45
16	49	160	128	104	80	64	48
17	52	170	136	110 1/2	85	68	51
18	55	180	144	117	90	72	54
19	58	190	152	123 1/2	95	76	57
20	61	200	160	130	100	80	60
21	64	210	168	136 1/2	105	84	63
22	67	220	176	143	110	88	66
23	70	230	184	149 1/2	115	92	69
24	73	240	192	156	120	96	72
25	76	250	200	162 1/2	125	100	75
Price per Square Foot		\$1.00	\$1.00	\$1.10	\$1.20	\$1.30	\$1.40

To find equivalent in inch pipe, multiply square foot surface by 3.

Length of Radiator is estimated on the basis of 3 inches for each section plus 1/2 inch on each end for plugs and bushings.

Schedule Tappings and Roughing-in Measurements, see pages 73-78.

IMPERIAL RADIATORS  
WINDOW PATTERN  
FIVE COLUMN—WATER OR STEAM  
MALLEABLE SCREW NIPPLE CONNECTIONS



IMPERIAL PATTERN  
Plain Only

Width of Section	13	Inches
Width of Legs	13	Inches
Distance from floor to centre of openings 16 in. and 20 in.	3 1/2	Inches
Distance from floor to centre of openings 14 in. and 18 in.	1 1/2	Inches
Distance between centres of twin connections	3 1/4	Inches

Made in Single or Twin connections.

To make 14 in. and 18 in., 2 in. is cut off legs of 16 in. and 20 in.

Note—For all other dimensions see pages 73-78.

# IMPERIAL RADIATOR COMPANY LIMITED

## IMPERIAL RADIATORS

MALLEABLE SCREW NIPPLE CONNECTIONS

### FIVE COLUMN

WINDOW RADIATOR

WATER OR STEAM

LISTS, CAPACITIES AND DIMENSIONS

Number of Sections	Length of Radiators Including Plugs and Bushings	HEATING SURFACE IN SQUARE FEET			
		20 in. high 6 sq. ft. per section	18 in. high 6 sq. ft. per section	16 in. high 4 $\frac{2}{3}$ sq. ft. per section	14 in. high 4 $\frac{2}{3}$ sq. ft. per section
2	7	12	12	9 $\frac{1}{3}$	9 $\frac{1}{3}$
3	10	18	18	14	14
4	13	24	24	18 $\frac{2}{3}$	18 $\frac{2}{3}$
5	16	30	30	23 $\frac{1}{3}$	23 $\frac{1}{3}$
6	19	36	36	28	28
7	22	42	42	32 $\frac{2}{3}$	32 $\frac{2}{3}$
8	25	48	48	37 $\frac{1}{3}$	37 $\frac{1}{3}$
9	28	54	54	42	42
10	31	60	60	46 $\frac{2}{3}$	46 $\frac{2}{3}$
11	34	66	66	51 $\frac{1}{3}$	51 $\frac{1}{3}$
12	37	72	72	56	56
13	40	78	78	60 $\frac{2}{3}$	60 $\frac{2}{3}$
14	43	84	84	65 $\frac{1}{3}$	65 $\frac{1}{3}$
15	46	90	90	70	70
16	49	96	96	74 $\frac{2}{3}$	74 $\frac{2}{3}$
17	52	102	102	79 $\frac{1}{3}$	79 $\frac{1}{3}$
18	55	108	108	84	84
19	58	114	114	88 $\frac{2}{3}$	88 $\frac{2}{3}$
20	61	120	120	93 $\frac{1}{3}$	93 $\frac{1}{3}$
21	64	126	126	98	98
22	67	132	132	102 $\frac{2}{3}$	102 $\frac{2}{3}$
23	70	138	138	107 $\frac{1}{3}$	107 $\frac{1}{3}$
24	73	144	144	112	112
25	76	150	150	116 $\frac{2}{3}$	116 $\frac{2}{3}$
Price per Square foot		\$1.36	\$1.40	\$1.50	\$1.55

To find equivalent in 1 inch pipe, multiply square foot surface by 3.

Length of Radiator is estimated on the basis of 3 in. for each section plus  $\frac{1}{2}$  in. on each end for plugs and bushings.

NOTE:—Schedule of Tappings and Roughing-in Measurements, Pages 73-78.

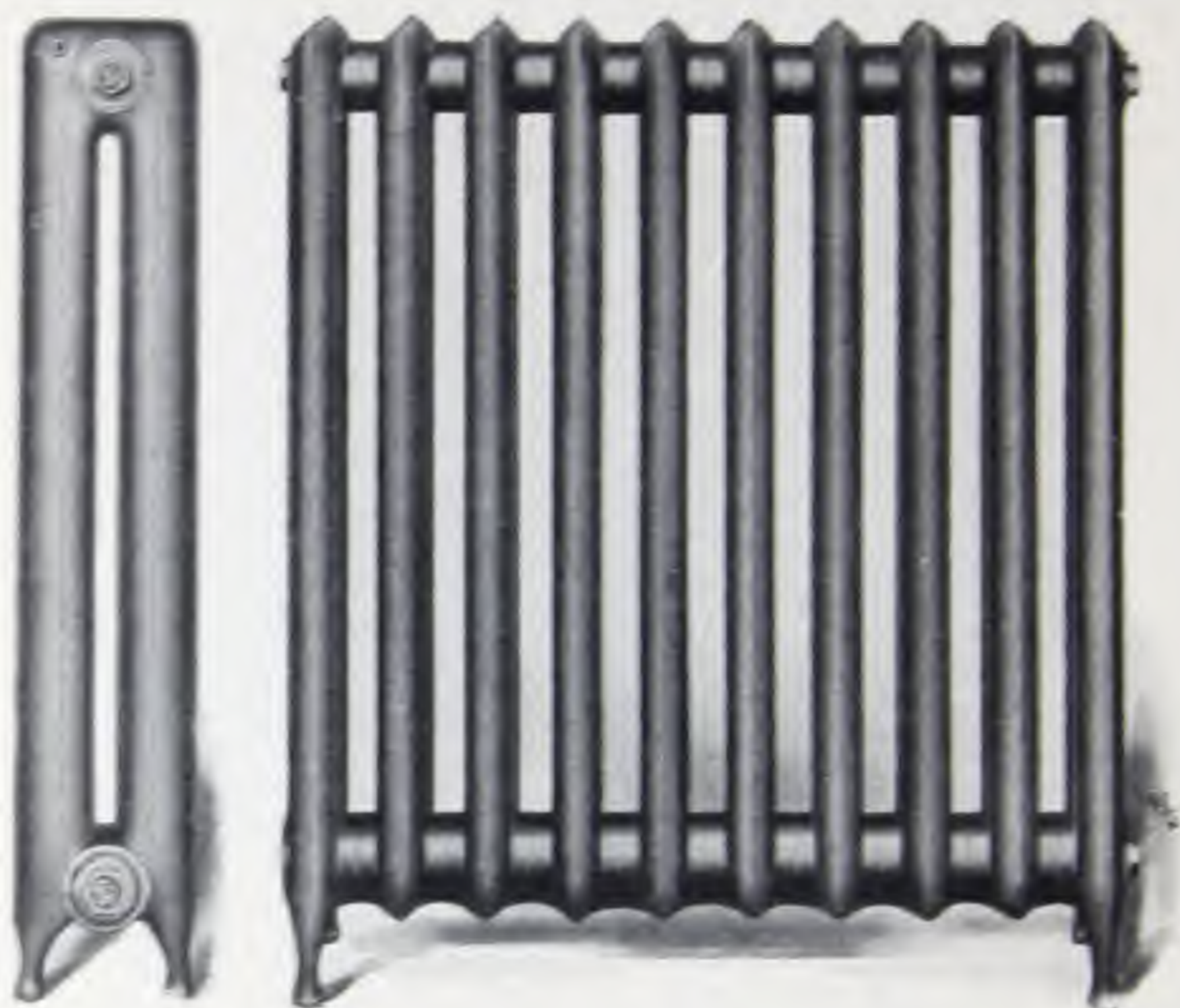
To make 14 in. and 18 in., 2 in. is cut off legs of 16 in. and 20 in.

## IMPERIAL RADIATORS

### IMPERIAL HOSPITAL PATTERN

#### TWO COLUMN—PLAIN ONLY

MALLEABLE SCREW NIPPLE CONNECTIONS



#### HOT WATER TYPE

##### Dimensions

Width of Section, Two Column	7 1/4 Inches
Width of Legs, Two Column	7 1/4 Inches
Distance from floor to centre of opening (Standard)	4 1/2 Inches
(Legs can be made any height required)	
Distance between centres of twin connections	3 1/4 Inches

Made in Single and Twin Connections.

For other Dimensions see pages 73-78.

# IMPERIAL RADIATORS

MALLEABLE SCREW NIPPLE CONNECTIONS

IMPERIAL HOSPITAL PATTERN

TWO COLUMN

WATER OR STEAM

LISTS, CAPACITIES AND DIMENSIONS

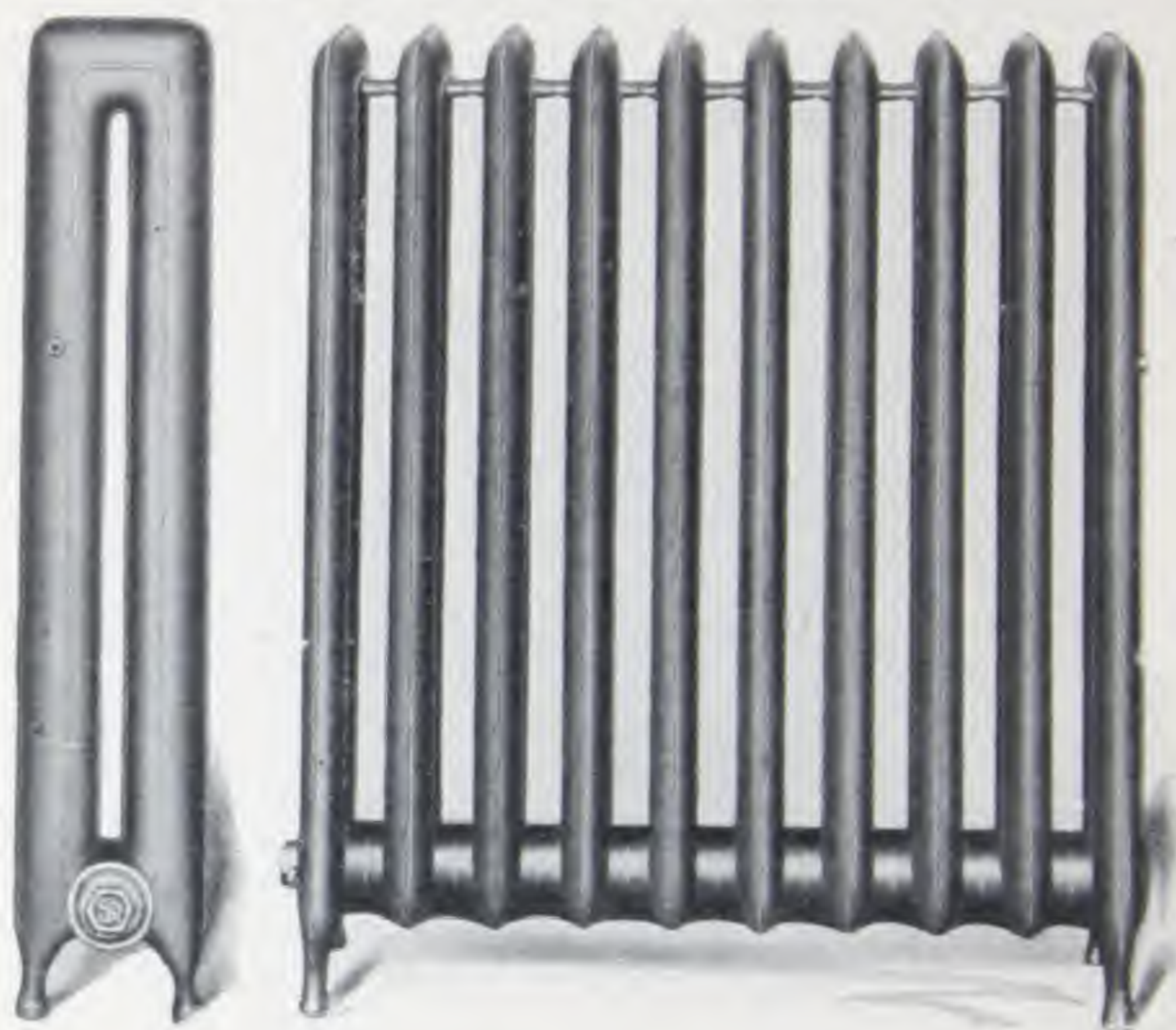
Number of Sections	Length of Radiator Including Plugs and Bushings	HEATING SURFACE IN SQUARE FEET						
		45 in. high 5 sq. ft. per section	38 in. high 4 sq. ft. per section	32 in. high 3 1/3 sq. ft. per section	30 in. high 3 sq. ft. per section	26 in. high 2 2/3 sq. ft. per section	23 in. high 2 1/3 sq. ft. per section	20 in. high 2 sq. ft. per section
2	7	10	8	6 2/3	6	5 1/3	4 2/3	4
3	10 1/2	15	12	10	9	8	7	6
4	14	20	16	13 1/3	12	10 2/3	9 1/3	8
5	17 1/2	25	20	16 2/3	15	13 1/3	11 2/3	10
6	21	30	24	20	18	16	14	12
7	24 1/2	35	28	23 1/3	21	18 2/3	16 1/3	14
8	28	40	32	26 2/3	24	21 1/3	18 2/3	16
9	31 1/2	45	36	30	27	24	21	18
10	35	50	40	33 1/3	30	26 2/3	23 1/3	20
11	38 1/2	55	44	36 2/3	33	29 1/3	25 2/3	22
12	42	60	48	40	36	32	28	24
13	45 1/2	65	52	43 1/3	39	34 2/3	30 1/3	26
14	49	70	56	46 2/3	42	37 1/3	32 2/3	28
15	53 1/2	75	60	50	45	40	35	30
16	56	80	64	53 1/3	48	42 2/3	37 1/3	32
17	59 1/2	85	68	56 2/3	51	45 1/3	39 2/3	34
18	63	90	72	60	54	48	42	36
19	66 1/2	95	76	63 1/3	57	50 2/3	44 1/3	38
20	70	100	80	66 2/3	60	53 1/3	46 2/3	40
21	73 1/2	105	84	70	63	56	49	42
22	77	110	88	73 1/3	66	58 2/3	51 1/3	44
23	80 1/2	115	92	76 2/3	69	61 1/3	53 2/3	46
24	84	120	96	80	72	64	56	48
25	87 1/2	125	100	83 1/3	75	66 2/3	58 1/3	50
Price per Sq. Foot		\$1.00	\$1.00	\$1.10	\$1.15	\$1.20	\$1.26	\$1.36

To find equivalent in 1 inch pipe, multiply square foot surface by 3.

Length of Radiator is estimated on the basis of 3 1/2 in. for every section, (except Leg Sections), plus 1/2 in. on each end for plugs and bushings.

NOTE:—Schedule of Tappings and Roughing-in Measurements, Pages 73-78.

IMPERIAL RADIATORS  
IMPERIAL HOSPITAL RADIATOR  
TWO COLUMN—PLAIN ONLY  
MALLEABLE SCREW NIPPLE CONNECTIONS



STEAM TYPE

Dimensions

Width of Section, Two Column.....	7 1/4 Inches
Width of Legs, Two Column.....	7 1/4 Inches
Distance from floor to centre of openings (Standard).....	4 1/2 Inches

(Legs can be made any height required)

Distance between centres of Twin Connections.....	3 1/4 Inches
---	--------------

Made in Single and Twin Connections

For other Dimensions see page 73-78.

# IMPERIAL RADIATORS

WALLABLE SCREW NIPPLE CONNECTIONS

IMPERIAL HOSPITAL PATTERN

THREE COLUMN

WATER OR STEAM

LISTS CAPACITIES AND DIMENSIONS

Number of Sections	Lengths of Sections including Flanges and Nipples	HEATING SURFACE IN SQUARE FEET.					
		18 in. High	24 in. High	30 in. High	36 in. High	42 in. High	48 in. High
		18 in. High	24 in. High	30 in. High	36 in. High	42 in. High	48 in. High
		18 in. High	24 in. High	30 in. High	36 in. High	42 in. High	48 in. High
10	10	10	10	10	10	10	10
12	12	12	12	12	12	12	12
14	14	14	14	14	14	14	14
16	16	16	16	16	16	16	16
18	18	18	18	18	18	18	18
20	20	20	20	20	20	20	20
22	22	22	22	22	22	22	22
24	24	24	24	24	24	24	24
26	26	26	26	26	26	26	26
28	28	28	28	28	28	28	28
30	30	30	30	30	30	30	30
32	32	32	32	32	32	32	32
34	34	34	34	34	34	34	34
36	36	36	36	36	36	36	36
38	38	38	38	38	38	38	38
40	40	40	40	40	40	40	40
42	42	42	42	42	42	42	42
44	44	44	44	44	44	44	44
46	46	46	46	46	46	46	46
48	48	48	48	48	48	48	48
50	50	50	50	50	50	50	50
52	52	52	52	52	52	52	52
54	54	54	54	54	54	54	54
56	56	56	56	56	56	56	56
58	58	58	58	58	58	58	58
60	60	60	60	60	60	60	60
62	62	62	62	62	62	62	62
64	64	64	64	64	64	64	64
66	66	66	66	66	66	66	66
68	68	68	68	68	68	68	68
70	70	70	70	70	70	70	70
72	72	72	72	72	72	72	72
74	74	74	74	74	74	74	74
76	76	76	76	76	76	76	76
78	78	78	78	78	78	78	78
80	80	80	80	80	80	80	80
82	82	82	82	82	82	82	82
84	84	84	84	84	84	84	84
86	86	86	86	86	86	86	86
88	88	88	88	88	88	88	88
90	90	90	90	90	90	90	90
92	92	92	92	92	92	92	92
94	94	94	94	94	94	94	94
96	96	96	96	96	96	96	96
98	98	98	98	98	98	98	98
100	100	100	100	100	100	100	100
Price per Sq. Foot		\$1.00	\$1.00	\$1.10	\$1.20	\$1.30	\$1.40

To find equivalent in 1 inch pipe, multiply square foot surface by 1.

Length of Radiator is estimated on the basis of 2 1/2 ft. for each section, except Lap Sections, plus 1/2 ft. on each end for flanges and nipples.

Note:—Schedule of Loadings see Weighting or Measurements, Pages 72-73.

IMPERIAL  
WALL RADIATORS

MALLEABLE SCREW NIPPLE CONNECTIONS



9 FT. VERTICAL SECTION

NOTE—For Diagrams and Measurements see pages 73-78.

# IMPERIAL WALL RADIATORS

## WATER AND STEAM—PLAIN MALLEABLE SCREW NIPPLE CONNECTIONS VERTICAL

### PRICES, DIMENSIONS AND CAPACITIES

Section	Height (Inches)	Length (Inches)	Thickness (Inches)	Heating Surface (Sq. Feet)	List Price
7 ft.	21 $\frac{7}{8}$	13 $\frac{5}{16}$	3 $\frac{1}{16}$	7	1.05
9 ft.	29 $\frac{1}{16}$	13 $\frac{5}{16}$	3 $\frac{1}{16}$	9	1.05
12 ft.	15 $\frac{5}{16}$	29 $\frac{1}{16}$	3 $\frac{1}{2}$	12	1.05

To find equivalent in 1 inch pipe, multiply square foot surface by 3.

Radiators may be made up of any number of sections and in any desired variety of vertical arrangement.

Orders should be accompanied by sketch showing tappings desired.

NOTE—For Diagrams and Measurements, see Pages 73-78.  
Schedule Tappings, Pages 73-78.

# KING WALL RADIATORS

## MALLEABLE SCREW NIPPLE CONNECTIONS

VERTICAL AND HORIZONTAL  
WATER OR STEAM

Plain Only

Lists, Capacities and Dimensions



Square Feet Per Section	Width Inches	Length Inches	Thickness of Hub Inches	Price List
9	13	24	3 1/4	\$1.05
7	13	24	3	1.05
6	13	21	3	1.10
5	13	17	3	1.15

To find equivalent in 1 inch pipe, multiply square foot surface by 3.

Radiators may be made up of any number of sections and in any desired variety of vertical or horizontal arrangement.

9 ft.—Vertical Section, Plain.

Orders must be accompanied by sketch showing tappings desired.

Floor wall brackets, to suit base boards and wall line, made in various styles.

## CLUSTER WALL RADIATORS

For Clustering Wall Radiators, we make an extra charge, as follows—

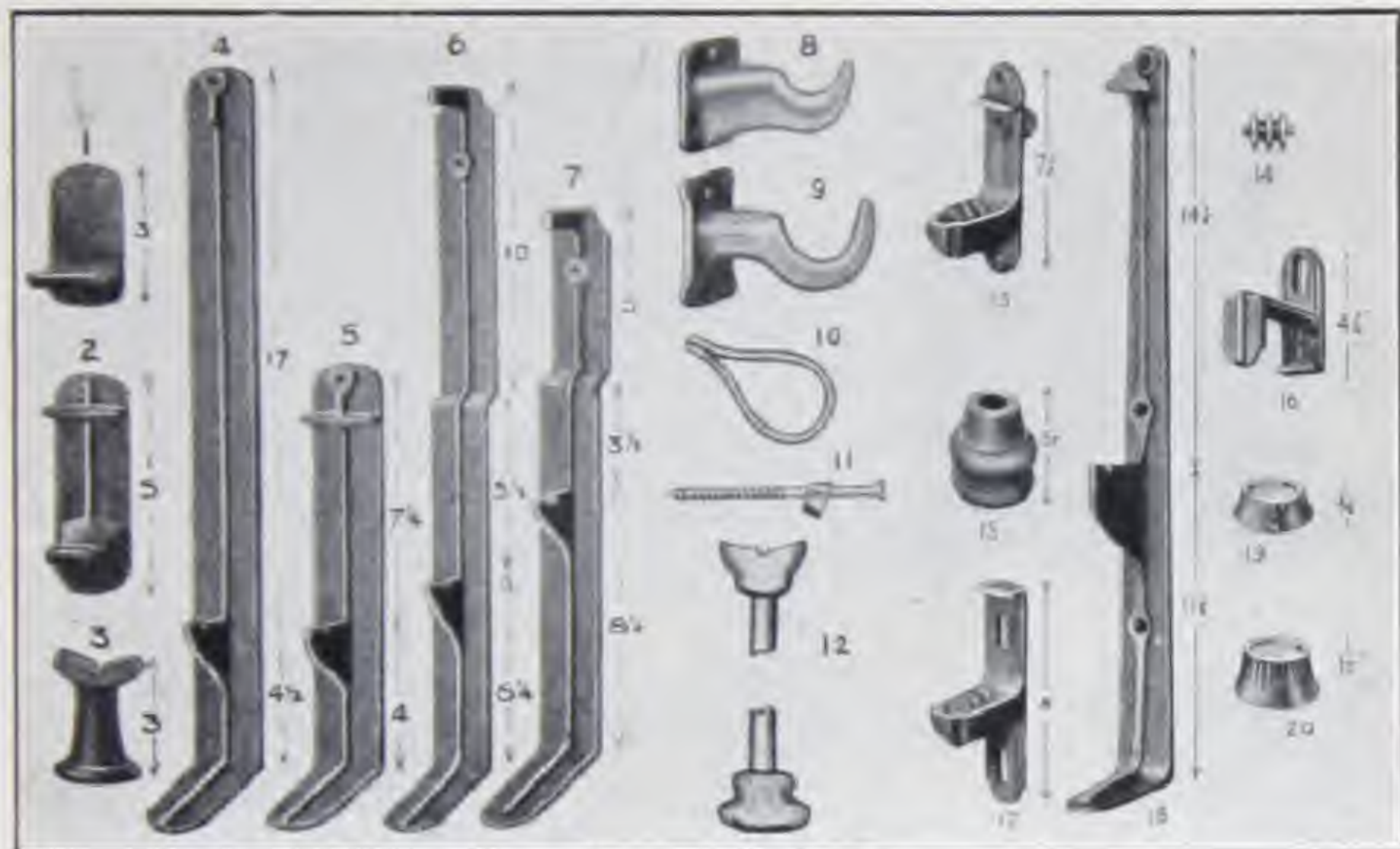
Sections Thick	1 and 2 Sections Long	3 and 4 Sections Long	5 and 6 Sections Long	7 and 8 Sections Long
2	\$4.00	\$4.50	\$5.00	\$5.50
3	6.00	6.50	7.00	7.50
4	8.00	8.50	9.00	9.50
5	10.00	10.50	11.00	11.50
6	12.00	12.50	13.00	13.50

Add for each additional thickness an extra charge of \$2.00 to above list prices.

Orders should be accompanied by sketch showing tappings desired.

NOTE—Schedule of Tappings, Diagrams and Measurements, see Pages 73-78.

# IMPERIAL and KING WALL RADIATOR BRACKETS ILLUSTRATIONS



## PRICE LIST

No.	1	2	3	4	5	6	7	8	9	10
List Price	.08	.10	.20	.50	.40	.50	.45	.50	.50	.60

No.	11	12	13	14	15	16	17	18	19	20
List Price	.20	.40								

NOTE—Nos. 8 and 9 are concealed Brackets used instead of the ordinary leg for supporting OUR one, two, three and four column Radiators.

No. 12 can be adjusted to any height desired.

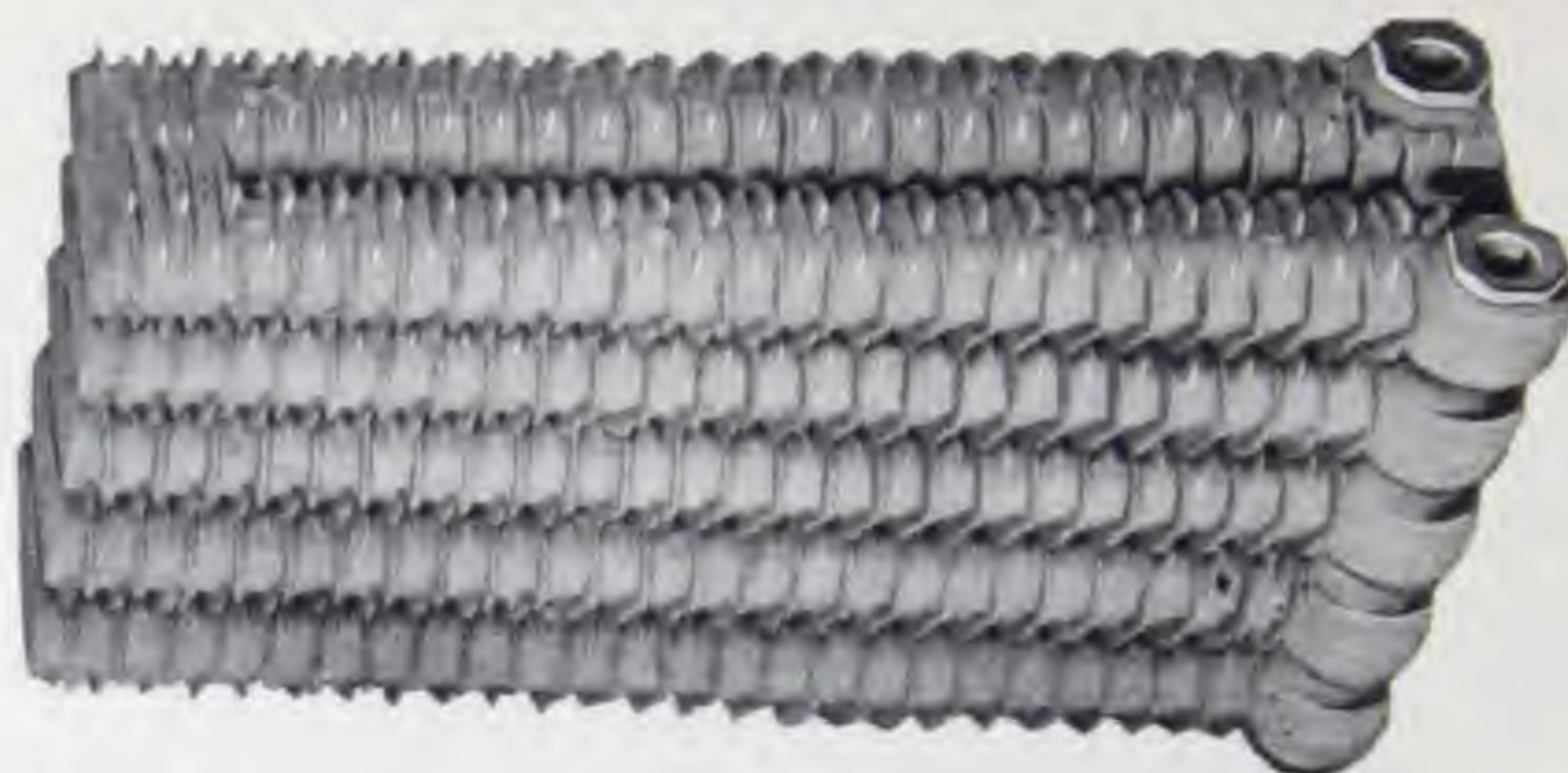
Wall Radiator Buttons only 10c. each.

## MEASUREMENTS

Distance from Wall to Centre of Single Connection Tappings.

BRACKET NOS.	1	2	8	9
Imperial Wall 9 ft.	2 1/4"	2 1/4"		
King Wall 7 ft.	2"	2"		
King Wall 9 ft.	2 7/16"	2 7/16"		
Imperial One Column			2 3/16"	2 3/16"
Imperial Two Column			4 3/8"	4 3/8"
Imperial Three Column			5 1/4"	5 1/4"
King Four Column			5 1/8"	5 1/8"

**IMPERIAL RADIATORS**  
**CLIMAX INDIRECT—WATER OR STEAM**  
**Malleable Screw Nipple Connections**



Length, 36 inches; height, 11 inches; width, 4 inches. Each section contains 13 square feet of heating surface.

**DATA FOR CLIMAX INDIRECT RADIATORS**

Sections in Stack.	Sq. feet of Heating Surface.	Area Cold Air Supply. Sq. inches.	Area Hot Air Flue. Sq. inches.	Size for Brick Work Hot Air Flues. Inches.	Size Register. Inches.
2	26	54	72	8 x 8	9 x 12
3	39	72	96	8 x 12	10 x 14
4	52	90	120	8 x 12	12 x 15
5	65	108	144	12 x 12	12 x 19
6	78	126	168	12 x 12	14 x 22
7	91	144	192	12 x 16	14 x 24
8	104	162	226	12 x 16	16 x 20
9	117	180	240	12 x 20	16 x 24
10	130	198	264	12 x 20	20 x 20
11	143	216	288	12 x 24	20 x 24
12	156	234	312	12 x 24	20 x 24

**LIST PRICE, CLIMAX INDIRECT (Loose or built) \$1.00 per sq. ft.**

NOTE—Shipped in single sections unless otherwise ordered.

# VENTO CAST IRON HOT BLAST HEATERS

## LIST, CAPACITY AND DIMENSIONS

Description	Sq. ft. per Section	List price per sq. ft.	Height	Width	Shipping Weights per sq. ft.
Regular 30 in. Section.....	8.00	\$1.15	30	9 $\frac{1}{8}$	9 $\frac{1}{4}$
Regular 40 in. Section.....	10.75	.90	41 $\frac{1}{64}$	9 $\frac{1}{8}$	9
Regular 50 in. Section.....	13.5	.90	50 $\frac{29}{32}$	9 $\frac{1}{8}$	9
Regular 60 in. Section.....	16.0	.90	60 $\frac{11}{16}$	9 $\frac{1}{8}$	9
Regular 72 in. Section.....	19.0	1.15	72 $\frac{3}{32}$	9 $\frac{1}{8}$	9
Narrow 40 in. Section.....	7.5	1.15	41 $\frac{1}{64}$	6 $\frac{3}{4}$	9 $\frac{1}{4}$
Narrow 50 in. Section.....	9.5	1.15	50 $\frac{29}{32}$	6 $\frac{3}{4}$	9 $\frac{1}{4}$
Narrow 60 in. Section.....	11.0	1.15	60 $\frac{11}{16}$	6 $\frac{3}{4}$	9 $\frac{1}{4}$

Extra 2 $\frac{1}{2}$ " Hexagon Nipple... Each \$ 1.00  
 Vento Nipple Wrench 2 $\frac{1}{2}$ "... Each 16.00  
 2 $\frac{1}{2}$ " L.H. Vento Plugs..... Each .45  
 2" and 2 $\frac{1}{2}$ " Bushings..... Each .50  
 Centre of Loops, 5"—5 $\frac{3}{8}$ " and 4 $\frac{5}{8}$ "  
 NOTE—Add 2 $\frac{1}{2}$ " for staggering of stacks.

Regular Tapping, 40", 50", 60".  
 Feed 2 $\frac{1}{2}$ " R.H. Return 2 $\frac{1}{2}$ " L.H.  
**Regular Tappings 30"**  
 Feed 2" R.H., Return 2" L.H.  
**Regular Tappings 72"**  
 Feed 3" R.H., Return 3" L.H.  
 Bushed to any size Required.  
 Air Vent Tapping,  $\frac{3}{8}$ "



Stack of Ten  
Regular Sections



Sectional  
72 View



Narrow  
Section

## IMPERIAL RADIATORS

### STANDARD TAPPINGS

#### ONE PIPE, STEAM

25 square feet and under.....	1 inch
Over 25, not to exceed 60 square feet.....	1½ inch
Over 60, not to exceed 100 square feet.....	1½ inch
Over 100 square feet.....	2 inch

All one pipe connections, unless otherwise ordered, are eccentric and tapped left hand.

#### TWO PIPE, STEAM

48 square feet and under.....	1 inch x ¾ inch
Over 48, but not to exceed 95 square feet.....	1½ inch x 1 inch
Over 95 square feet.....	1½ inch x 1½ inch

All two pipe connections, unless otherwise ordered, are tapped right hand. Return opening is tapped eccentric.

#### WATER, SINGLE OR TWIN CONNECTIONS

48 square feet and under.....	1 inch x 1 inch
Over 48 square feet.....	1¼ inch x 1¼ inch
Over 100 square feet (if ordered).....	1½ inch x 1½ inch

All Hot water Radiators are shipped twin connections, tapped left hand unless otherwise ordered. Single or top and bottom connections are tapped right hand.

Wall Radiators are tapped top and bottom same end, left hand for hot water unless otherwise ordered.

**NOTE.**—When using union valves or union elbows please state this fact in ordering, so that connections may be tapped right hand.

In ordering, give number of sections in each Radiator, height of same, size of tapping, whether right or left hand, and state if for water or steam, and if plain or ornamental.

**NOTE.**—For Prices and Capacities, see Radiator Section, pages 53-72.

**TAPPINGS**

**THERMOSTATIC TRAP STEAM HEATING SYSTEMS  
HOT WATER TYPE RADIATION—TOP—INLET  
VAPOR SYSTEM—8 OZ. PRESSURE**

Sq. Ft. Radiation	Supply			Return		
	Inlet Valve Inches	Vertical Pipe to Inlet valve Inches	Horizontal Run out To Riser Inches	Trap No.	Stub to Trap Inches	Horizontal Runout to Return ris- er Inches
1-25	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{1}{2}$	$\frac{3}{4}$
26-80	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$\frac{1}{2}$	$\frac{3}{4}$
81-100	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	1	$\frac{1}{2}$	$\frac{3}{4}$
101-140	1	1	$1\frac{1}{4}$	2	$\frac{1}{2}$	$\frac{3}{4}$
141-180	1	1	$1\frac{1}{4}$	2	$\frac{1}{2}$	$\frac{3}{4}$

**RETURN SYSTEMS AND VACUUM SYSTEMS RADIATOR  
CONNECTIONS**

**Hot Water Type Radiation—Top Inlet**

Sq. Ft. Radiation	Supply			Return		
	Inlet Valve Inches	Vertical Pipe to Inlet valve Inches	Horizontal Run out To Riser Inches	Trap No.	Stub to Trap Inches	Horizontal Runout to Riser Inches
1-25	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{1}{2}$	$\frac{3}{4}$
26-100	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$\frac{1}{2}$	$\frac{3}{4}$
101-180	1	1	$1\frac{1}{4}$	2	$\frac{1}{2}$	$\frac{3}{4}$
181-300	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$\frac{1}{2}$	$\frac{3}{4}$

**RADIATOR CONNECTIONS**

**Steam Type Radiation—Bottom Inlet**

Sq. Ft. Radiation	Supply			Return		
	Inlet Valve Inches	Vertical Pipe to Inlet valve Inches	Horizontal Run out to Riser Inches	Trap No.	Stub to Trap Inches	Horizontal Runout to Riser Inches
1-25	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{1}{2}$	$\frac{3}{4}$
26-80	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$\frac{1}{2}$	$\frac{3}{4}$
81-150	1	1	$1\frac{1}{4}$	2	$\frac{1}{2}$	$\frac{3}{4}$
151-300	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$\frac{1}{2}$	$\frac{3}{4}$
301-450	$1\frac{1}{2}$	$1\frac{1}{2}$	2	3*	$\frac{3}{4}$	$\frac{3}{4}$

\* No. 1—Radiator Trap up to 100 square feet.

\*No. 2 Radiator Trap up to 350 square feet.

NOTE—Returns for all above systems must be eccentric. Air vent Tapping for all above Systems must be Plugged.

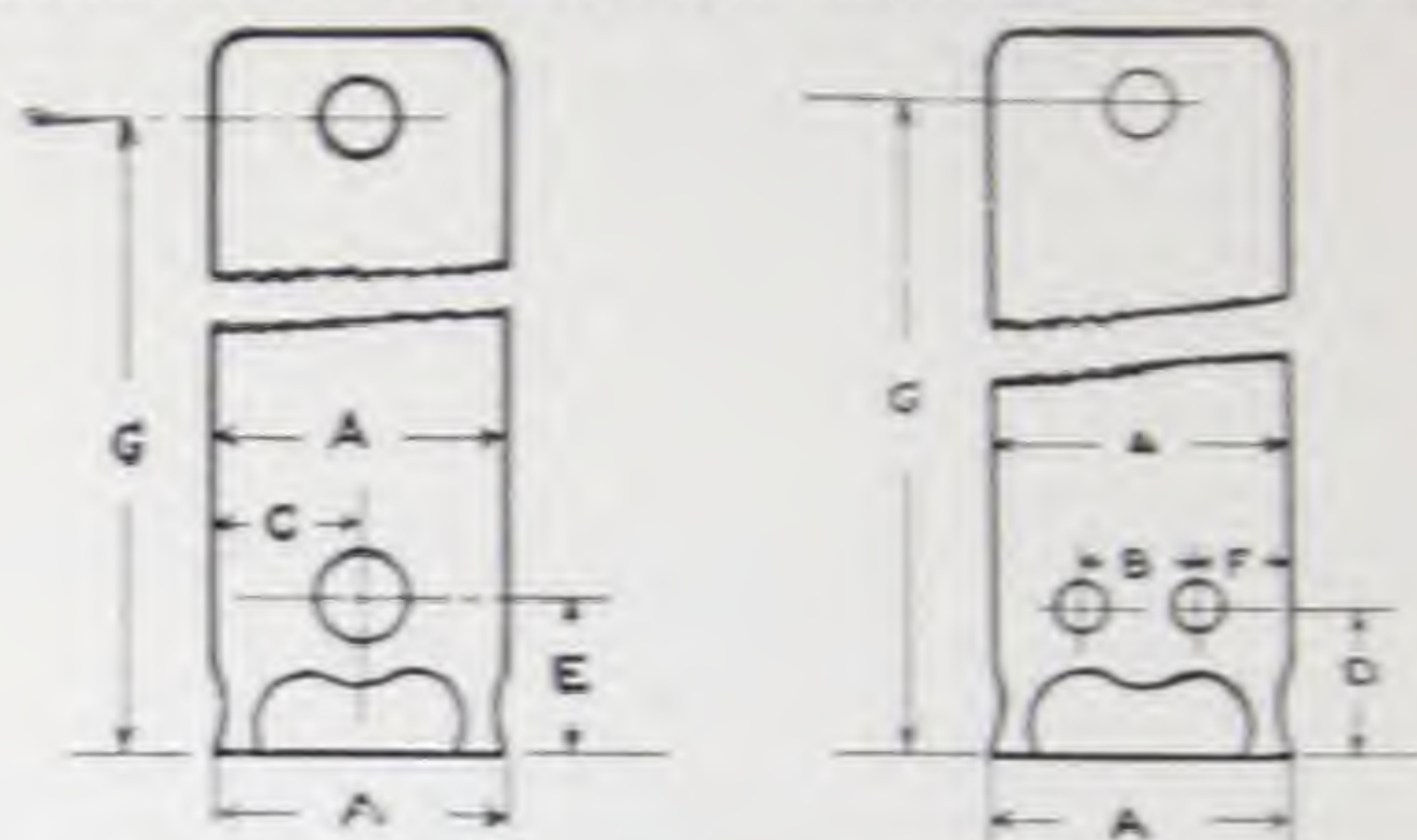
**TAPPINGS FOR HONEYWELL SYSTEM FOR SINGLE AND TWIN  
CONNECTION**

Ground Floor	1st Floor	2nd, 3rd, 4th, 5th, Floors	Tappings
Up to 30 feet	Up to 40 feet	Up to 50 feet	$\frac{1}{2}$ inch
30 to 60 feet	40 to 100 feet	50 to 125 feet	$\frac{3}{4}$ inch
60 to 100 feet	Over 100 feet	Over 125 feet	1 inch
Over 100 feet			$1\frac{1}{4}$ inch

Use one size larger tappings for Radiators on the extreme ends of long mains.  
Special tappings when Honeywell unique valves are used.

# IMPERIAL AND KING RADIATORS

## DIMENSIONS OF LOOPS AND CENTRES OF TAPPINGS



Tappings for Water, also supply end of Steam Radiators

Particulars		A	B	C	D	E	F
1 Column Imperial	inches	4 1/4		2 1/4		4 1/4	
2 Column Imperial	inches	7 1/4	3 1/4	3 1/4	4 1/4	4 1/4	3 1/4
3 Column Imperial	inches	9 1/4	3 1/4	4 1/4	4 1/4	4 1/4	3 1/4
4 Column Imperial	inches	11 1/4	3 1/4	3 1/4	4 1/4	4 1/4	4 1/4
5 Column Imperial	16 and 20 inches	12	3 1/4	6 1/4	4 1/4	4 1/4	4 1/4
5 Column Imperial	14 and 18 inches	13	3 1/4	6 1/4	4 1/4	4 1/4	4 1/4
2 Column King	inches	7	3 1/4	3 1/4	4	4 1/4	3 1/4
3 Column King	inches	9	3 1/4	4 1/4	4 1/4	4 1/4	3 1/4
4 Column King	inches	8 1/4	3 1/4	4 1/4	4	4 1/4	3 1/4

Note—Width of legs and sections are the same.

## ECCENTRIC TAPPINGS—STEAM

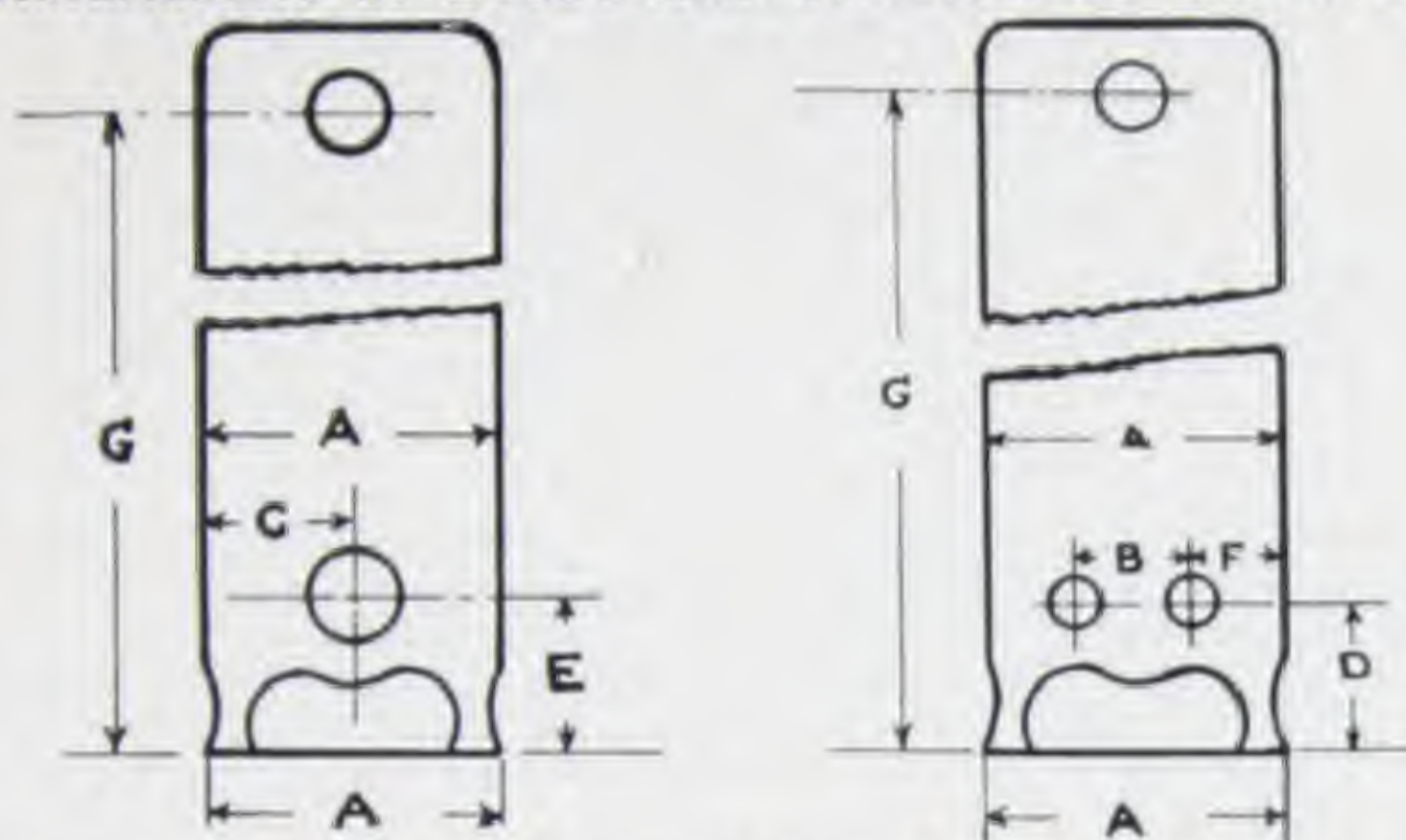
Distance from floor to centre of bottom opening

Size Tapping		1 1/2"	1 3/4"	1"	3/4"	1/2"
1 Column Imperial	inches	4 1/4	4 1/4	4	3 1/4	3 1/4
2 Column Imperial	inches	4 1/4	4 1/4	4	3 1/4	3 1/4
3 Column Imperial	inches	4 1/4	4 1/4	4	3 1/4	3 1/4
4 Column Imperial	inches	4 1/4	4 1/4	4	3 1/4	3 1/4
5 Column Imperial	16 and 20 inches	3 1/4	3 1/4	3	3 1/4	3 1/4
5 Column Imperial	14 and 18 inches	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
2 Column King	inches	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4
3 Column King	inches	4 1/4	4 1/4	4	3 1/4	3 1/4
4 Column King	inches	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4

Note—For Prices and Capacities see Radiator Sections, Pages 53-72.

# IMPERIAL AND KING RADIATORS

## DIMENSIONS OF LOOPS AND CENTRES OF TAPPINGS



G:—DISTANCE FROM FLOOR TO CENTRE OF TOP OPENING

Height-Radiator	45	44	42	38	32	30	26	23	22	20	18	16	14
1 Col. Imperial...				35 <sup>3</sup> / <sub>4</sub>	29 <sup>3</sup> / <sub>4</sub>		23 <sup>3</sup> / <sub>4</sub>	20 <sup>3</sup> / <sub>4</sub>		17 <sup>3</sup> / <sub>4</sub>			
2 Col. Imperial...	41 <sup>3</sup> / <sub>4</sub>			35 <sup>3</sup> / <sub>4</sub>	29 <sup>3</sup> / <sub>4</sub>	27 <sup>1</sup> / <sub>2</sub>	24	20 <sup>7</sup> / <sub>8</sub>		18 <sup>1</sup> / <sub>4</sub>			
3 Col. Imperial...		41 <sup>3</sup> / <sub>4</sub>		35 <sup>3</sup> / <sub>4</sub>	29 <sup>3</sup> / <sub>4</sub>		23 <sup>3</sup> / <sub>4</sub>		19 <sup>3</sup> / <sub>4</sub>		15 <sup>3</sup> / <sub>4</sub>		
4 Col. Imperial...	42 <sup>1</sup> / <sub>2</sub>			35 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>		23 <sup>1</sup> / <sub>2</sub>		19 <sup>1</sup> / <sub>2</sub>		15 <sup>1</sup> / <sub>2</sub>		
5 Col. Imperial...										18	16 <sup>1</sup> / <sub>2</sub>	14 <sup>1</sup> / <sub>8</sub>	12 <sup>5</sup> / <sub>8</sub>
2 Col. King...	42 <sup>1</sup> / <sub>2</sub>			35 <sup>3</sup> / <sub>8</sub>	29 <sup>1</sup> / <sub>2</sub>		23 <sup>3</sup> / <sub>8</sub>	20 <sup>5</sup> / <sub>8</sub>		17 <sup>5</sup> / <sub>8</sub>			
3 Col. King...		41 <sup>1</sup> / <sub>2</sub>		35 <sup>1</sup> / <sub>2</sub>	29 <sup>1</sup> / <sub>2</sub>		23 <sup>1</sup> / <sub>2</sub>		19 <sup>1</sup> / <sub>2</sub>		15 <sup>3</sup> / <sub>4</sub>		
4 Col. King...			39 <sup>5</sup> / <sub>8</sub>	36	30		24			18		14	

NOTE—Bushings are used as follows—Hot water single connections both ends.  
Top and bottom connection both ends.  
Steam two pipe one end.

# IMPERIAL AND KING

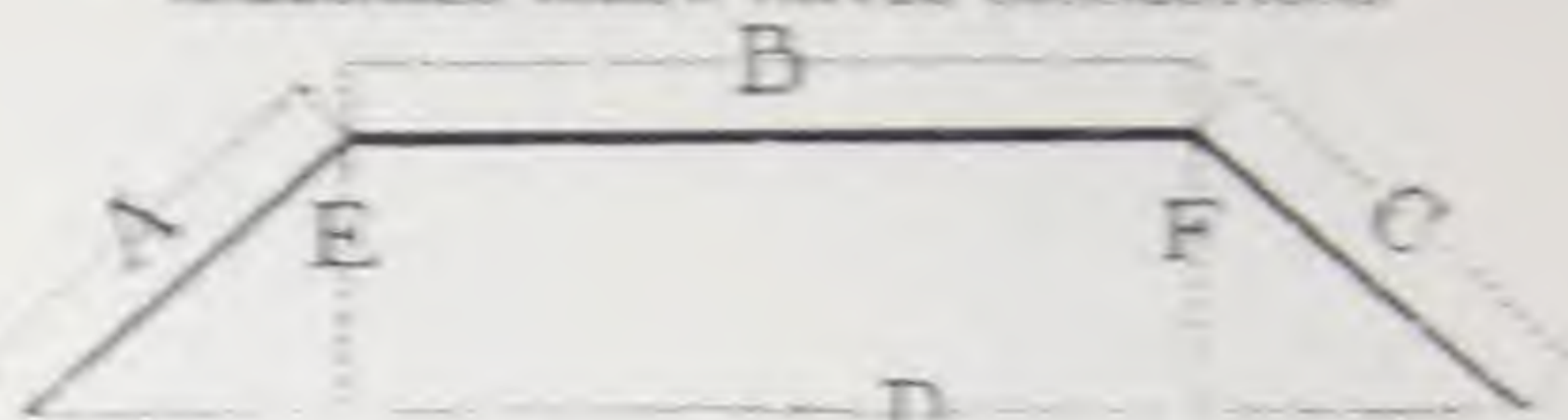
## WALL RADIATORS

### ACTUAL DIMENSIONS AND ROUGHING-IN MEASUREMENTS

Sq. ft. Per Section	Description	Length or Height Inches	Width Inches	Thickness of Hub Inches	Centre to Centre of Tappings Inches	
					End of Section	Side of Section
9	Imperial	28 <sup>3</sup> / <sub>4</sub>	13 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>		25 <sup>5</sup> / <sub>8</sub>
9	King	23 <sup>9</sup> / <sub>16</sub>	13	3 <sup>1</sup> / <sub>4</sub>	10 <sup>5</sup> / <sub>16</sub>	20 <sup>5</sup> / <sub>8</sub>
7	King	23 <sup>9</sup> / <sub>16</sub>	13	3	10 <sup>5</sup> / <sub>16</sub>	20 <sup>5</sup> / <sub>8</sub>
7	Imperial	21 <sup>7</sup> / <sub>8</sub>	13 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>		18 <sup>7</sup> / <sub>16</sub>
6	King	20 <sup>9</sup> / <sub>16</sub>	13	3	10 <sup>1</sup> / <sub>4</sub>	17 <sup>11</sup> / <sub>16</sub>
5	King	17	13	3	10 <sup>5</sup> / <sub>16</sub>	14 <sup>3</sup> / <sub>16</sub>

NOTE—For Prices and Capacities, see Radiator Section, pages 53-72.

**IMPERIAL AND KING RADIATORS**  
**BAY WINDOW—SPECIALS—CIRCULAR**  
 MALLEABLE SCREW NIPPLE CONNECTIONS



In ordering this style of Radiator an exact sketch should be furnished, but where this is not considered the above diagram will be required.

Care must be taken to give exact measurements indicated by letters A, B, C, D, E, F. If two connections are required, state if on right or left hand side as you stand facing the window or inner side of Radiator.

Made in one, two, three and four column and Wall styles in any height and size to suit window.

Note—Corner Radiators are always made single connection.

**APPROXIMATE SPACE OCCUPIED BY ANGLE AND CORNER SECTIONS**

Style	2 Column		3 Column		4 Column King		5 Column		Wall
IMPERIAL AND KING	Angle	Corner	Angle	Corner	Angle	Corner	Angle	Corner	Angle
Distance each way from center of Angle									
Up to face of Standard base	4 in.	4 in.	4 1/2 in.	10 in.	3 in.	10 in.	4 1/2 in.	10 in.	1 1/2 in.

**DIMENSIONS FOR CIRCULAR RADIATORS**

Made in one, two, three or four column, any height, of the following dimensions—

TWO COLUMN			THREE COLUMN			FOUR COLUMN		
No. of Sections	Outside Diam.	Inside Diam.	No. of Sections	Outside Diam.	Inside Diam.	No. of Sections	Outside Diam.	Inside Diam.
14	21 1/2	7 1/4	12	26 1/2	6 1/2	12	32	11 1/2
16	23 1/2	8 1/2	14	28 1/2	7 1/2	14	34	12 1/2
18	25 1/2	11	16	30 1/2	8 1/2	16	36 1/2	14 1/2
20	27 1/2	12 1/2	18	32 1/2	9 1/2	18	38 1/2	16 1/2
22	29 1/2	14 1/2	20	34 1/2	10 1/2	20	40 1/2	18 1/2
24	31 1/2	16 1/2	22	36 1/2	11 1/2	22	42 1/2	20 1/2
26	33 1/2	18 1/2	24	38 1/2	12 1/2	24	44 1/2	22 1/2
28	35 1/2	20 1/2	26	40 1/2	13 1/2	26	46 1/2	24 1/2

All full circle Radiators are made in halves, with supply and return on side or bottom of sections of each half. State style of connection required.

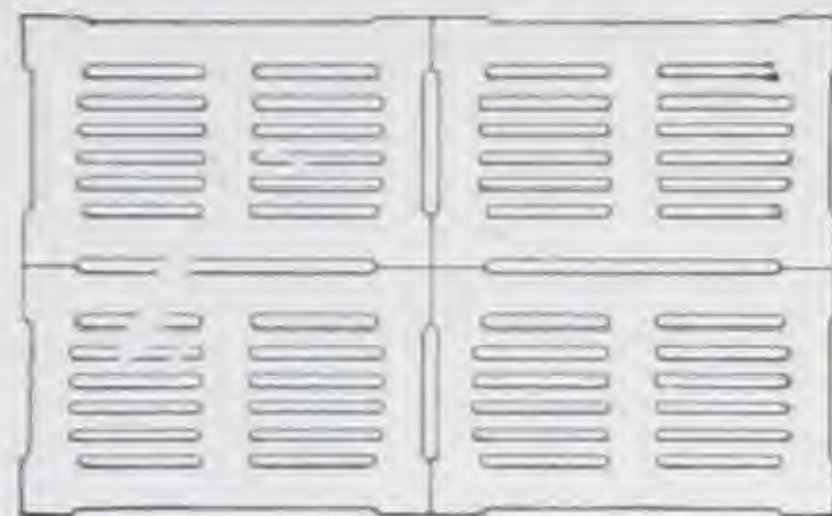
Note—For measurements, see page 75-76. For prices and capacities, see Radiator Section, pages 58-71.

## IMPERIAL AND KING WALL RADIATORS

Diagrams showing usual forms of assembling. These may be increased any number of sections to secure the desired heating capacity.



**Diagram 1.—Horizontal**



**Diagram 2.—Horizontal Tiered**

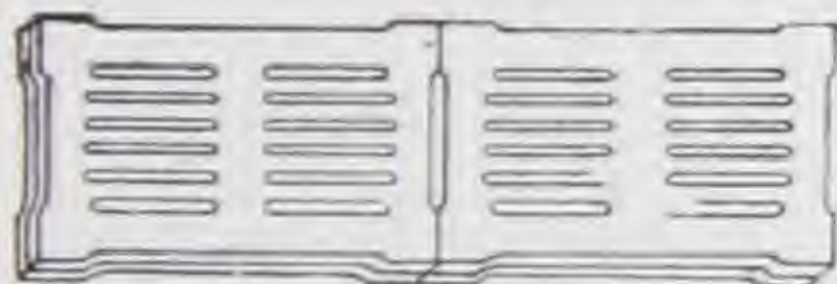


**Diagram 4.—Vertical, Tiered**

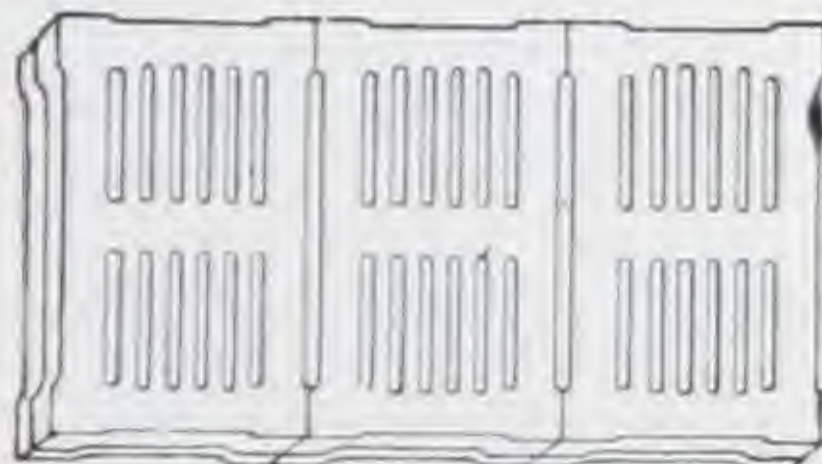


**Diagram 3.—Vertical**

### CLUSTER



**Diagram 5.—Horizontal Cluster**



**Diagram 6.—Vertical Cluster**

Orders should be accompanied by sketch showing tapplings desired.

NOTE:—For Measurements, see Page 76.

For Prices and Capacities, see Radiator Section, Pages 53-72.

INSTRUCTIONS  
*for*  
ORDERING RADIATORS  
*and*  
RADIATOR REPAIRS

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State plainly the catalogue name. Always mention number of columns and height of radiator required. Also, whether for Hot Water, Hot Water for Steam, or Steam Type. If Steam Type, state whether for one or two-pipe system. Give connections and size of tappings, right or left hand.

**KING RADIATORS**  
**OBSOLETE**  
**TWO COLUMN—WATER OR STEAM**  
**MALLEABLE SCREW\_NIPPLE CONNECTIONS**



**KING PATTERN**  
**HEIGHTS, DIMENSIONS AND CAPACITIES**

Measurements	Centre to Centre of Sections	Width		Distance			
		Sections	Legs	Floor to Centre of Opening	Between Cen- tres of Twin Connections		
	2 1/2"	7 1/4"	7 1/4"	4"	3 1/4"		
Heights		45"	38"	32"	26"	23"	20"
Square Feet per Section		5	4	3 1/3	2 2/3	2 1/3	2

NOTE:—This pattern only made to order for repairs. For additional measurements See Roughing Section pages 75-76. For all other Radiators See pages 53-72.

**KING RADIATORS**  
**OBSOLETE**  
**THREE COLUMN—WATER OR STEAM**  
**MALLEABLE SCREW NIPPLE CONNECTIONS**



**KING PATTERN**  
**HEIGHTS, DIMENSIONS AND CAPACITIES**

Measurements	Centre to Centre of Sections	Width		Distance			
		Sections	Legs	Floor to Centre of Opening	Between Centres of Connections		
	2½"	9"	9"	4½"	3¼"		
Heights		44"	38"	32"	26"	22"	18"
Square Feet per Section		6	5	4½	3¾	3	2¼

NOTE:—This pattern only made to order for repairs. For additional measurements See Roughing-in Section pages 75-76. For all other Radiators See pages 53-72

**KING RADIATORS**  
**FOUR COLUMN—WATER OR STEAM**  
**MALLEABLE SCREW NIPPLE CONNECTIONS**



**KING PATTERN**  
**HEIGHTS, DIMENSIONS AND CAPACITIES**

Measurements	Centre to Centre of Sections	Width			Distance		
		Sections	Legs	Floor to Centre of Openings	Between Centres of Connections		
	4"	8 3/4"	8 3/4"	4"	3 1/4"		
Heights		42"	38"	32"	26"	20"	16"
Square Feet per Section		9 2/3	8	6 1/2	5	4	2 1/2

For additional measurements see Roughing-in Section, pages 75-76.  
 For all other Radiators see pages 53-72.

## RADIATOR VALVES

Size	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
N P. Quick Opening "Angle" no union		2.95	3.25	3.90	5.00	6.30	10.50
N P. Quick Opening "Angle" with union		3.25	3.70	4.50	5.75	7.30	12.00
N P. Radiator Elbows with union		1.75	2.00	2.50	3.30	4.25	7.20
N P. Jenkins Disc "Angle" no union		3.40	3.85	4.50	5.65	7.40	12.10
N P. Jenkins Disc "Angle" with union		3.70	4.30	5.10	6.40	8.40	13.60
N P. Jenkins Disc "Globe" no union		3.40	3.85	4.50	5.65	7.40	12.10
N P. Jenkins Disc "Lockshield" no union		3.40	3.85	4.50	5.65	7.40	12.10
N P. Jenkins Disc "Lockshield" with union		3.70	4.30	5.10	6.40	8.40	13.60
N P.W.W. Standard "Angle" no union		4.00	4.45	5.25	6.40	8.40	13.35
N P. W. W. Standard "Angle" with union		4.30	4.90	5.85	7.15	9.40	14.85
N P.W.W. Standard "Lockshield" no union		4.00	4.45	5.25	6.40	8.40	13.35
N P.W.W. Standard "Lockshield" with union		4.30	4.90	5.85	7.15	9.40	14.85
N P.W.W. Gate no union		2.40	3.00	3.85	5.00	6.60	9.65
N P. W.W. Gate with union		3.65	4.25	5.20	6.60	9.00	12.80

Genuine Jenkins Radiator Valves same list as Jenkins Disc.

## RADIATOR AIR VALVES

DESCRIPTION	PRICE
Compression Wood Wheel	Per doz. 2.50
Compression Metal Wheel	" 4.50
Compression Loose Key	" 3.75
Loose Key "extra"	" 2.50
"Warco" Automatic Steam	List each 1.75
No. 1 Hoffman Automatic Siphon Air Valve	Per doz. 22.80
No. 3 Hoffman Automatic "Air Line" Valve	" 30.00
No. 4 Hoffman Junion Quick Vent Air Valve "For Mains"	" 33.60
Government Pattern Lockshield $\frac{1}{8}$	" 11.25
Government Pattern Lockshield $\frac{1}{4}$	" 15.00

# STANDARD BRASS VALVES, BRASS AND IRON COCKS AND FOOT VALVES

Sizes	1/8 1/4 3/8 1/2 3/4 1 1 1/4 1 1/2 2 2 1/2 3 3 1/2 4												
	\$ c	\$ c	\$ c	\$ c	\$ c	\$ c	\$ c	\$ c	\$ c	\$ c	\$ c	\$ c	\$ c
Standard Globe and Angle Valves.....	...	72	77	1 00	1 26	1 80	2 52	3 50	5 30	10 00	14 40	26 50	36 00
" Peet Gate Valves.....	...	...	...	1 30	1 75	2 50	3 50	5 00	7 50	...	...	...	...
" Gate Valves.....	1 15	1 45	1 65	2 05	2 80	3 70	5 00	7 30	13 00	19 00	...	...	...
Jenkins Disc Globe and Angle Valves.....	1 10	1 25	1 60	2 20	2 80	4 00	5 50	8 75	15 75	22 00	...	...	...
Standard Horizontal Check Valves .....	65	65	70	90	1 15	1 60	2 25	3 15	4 75	9 00	13 00	24 00	32 50
" Vertical and Angle Check Valves...	...	72	77	1 00	1 26	1 80	2 52	3 50	5 30	...	...	...	...
" Swing Check Valves.....	...	...	1 80	2 00	2 25	2 80	3 65	4 75	6 75	15 00	24 00	...	...
Jenkins Disc Check Valves.....	...	1 10	1 20	1 30	1 90	2 60	3 60	5 00	7 50	13 50	...	...	...
Discs for Jenkins Valves.....	—	6	8	8	10	12	18	24	36	48	80	100	120
Steam Cocks, Square Head, Brass.....	...	85	1 00	1 25	1 70	2 35	3 70	4 85	7 30	14 50	22 50	38 50	50 00
" " Three Way, Brass.....	...	...	2 10	2 50	3 00	3 75	5 75	7 15	11 00	18 75	26 00	50 00	70 00
" " Iron.....	...	85	85	90	1 05	1 30	1 60	1 95	2 70	4 40	6 75	12 00	15 50
" " with Brass Washer..	...	...	...	1 00	1 20	1 55	1 95	2 35	3 20	5 15	7 75	14 00	19 00
" " Plug.....	...	...	...	1 30	1 60	1 90	2 65	3 75	5 25	8 75	13 00	27 50	36 50
" " Three Way.....	...	...	...	...	1 65	1 80	2 05	2 65	3 65	5 35	7 50	14 00	19 00
" " with Brass Washer	...	Washer	...	...	1 80	2 05	2 40	3 05	4 15	6 10	8 50	16 00	22 50
" " Plug	...	...	...	...	2 20	2 40	3 10	4 50	6 25	9 75	13 75	30 00	40 00
Pet Cocks, T Handle.....	40	45	50	60	...	...	...	...	...	...	...	...	...
" " L.....	55	60	65	75	...	...	...	...	...	...	...	...	...
Foot Valves, Iron, Black.....	...	...	...	...	1 15	1 30	1 40	1 90	2 40	3 30	3 90	5 60	7 30
" " Galvanized.....	...	...	...	...	1 75	2 00	2 10	2 85	3 60	5 00	5 75	8 50	11 00

## COMPRESSION BIBBS AND STOP COCKS

Sizes	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Compression Bibb, 1 P. Finished	\$18.00	\$18.60	\$19.50	\$33.00	\$60.00
" Hose and Iron Finished		21.60	22.80	36.00	67.20
" Stop Cock, 1. P. Finished	15.60	16.20	19.80	33.00	60.00
Comp. S. & W. Cock, 1. P. Rg'h, including S.B.		25.80	29.40	43.80	76.80
Rough Stop Cocks, T and L Handle	19.80	20.40	21.00	36.00	32.80
Rough, S. & W. " "	20.40	21.00	21.60	36.60	54.00

# STANDARD IRON BODY VALVES

Sizes	2	2½	3	3½	4	4½	5	6	7	8	10	1½
Globe & Ang. Standard without Yoke	Sed.	each \$ c.	each \$ c.	each \$ c.	each \$ c.	each \$ c.	each \$ c.	each \$ c.	each \$ c.	each \$ c.	each \$ c.	each \$ c.
"	Flg'd	5 40	7 35	9 80	12 50	15 25	19 00	24 00	27 50	31 00	42 00	170 00
"	Sed.	7 00	9 00	12 50	15 25	19 00	24 00	27 50	31 00	42 00	170 00	187 00
"	Flg'd	7 00	9 00	12 50	15 25	19 00	24 00	27 50	31 00	42 00	170 00	187 00
Globe & Ang. Jenk. Disc without Yoke	Sed.	7 25	11 00	16 00	21 50	26 00	34 00	42 00	50 00	63 00	77 00	187 00
"	Flg'd	8 50	13 00	18 00	24 00	29 00	37 00	45 00	55 00	68 00	84 00	205 00
"	Sed.	10 00	12 00	16 75	19 50	24 00	30 00	37 00	45 00	55 00	68 00	185 00
"	Flg'd	11 75	14 00	18 50	21 50	26 00	34 00	42 00	50 00	63 00	77 00	185 00
Horizontal Check Valves	Sed.	3 60	6 50	8 90	12 25	14 25	19 00	22 00	30 00	45 00	57 00	155 00
"	Flg'd	3 60	6 50	8 90	12 25	14 25	19 00	22 00	30 00	45 00	57 00	155 00
Horizontal	Flg'd	5 25	8 25	11 50	15 50	18 00	22 50	26 00	35 00	50 00	62 00	175 00
Angle	Flg'd	5 25	8 25	11 50	15 50	18 00	22 50	26 00	35 00	50 00	62 00	175 00
Vertical	Sed.	7 00	9 50	12 50	17 00	21 00	30 00	38 00	40 00	62 00	73 00	125 00
"	Flg'd	8 75	11 50	15 00	20 00	25 00	33 00	37 00	45 00	67 00	78 00	135 00
Cross Safety Val. Sed., ea., size 14 35, 11 85 80	Sed.	7 80	13 25	17 25	23 00	28 75	34 50	41 50	57 75	93 50	132 00	160 00
"	Flg'd	7 80	13 25	17 25	23 00	28 75	34 50	41 50	57 75	93 50	132 00	160 00
"	Sed.	10 25	16 00	21 50	27 50	34 00	40 00	48 00	65 00	100 00	140 00	168 00
"	Flg'd	10 25	16 00	21 50	27 50	34 00	40 00	48 00	65 00	100 00	140 00	168 00
Swing Check Valves	Sed.	12 00	13 50	17 50	21 00	26 00	30 00	36 00	55 00	70 00	110 00	160 00
"	Flg'd	14 50	17 00	21 00	26 00	30 00	34 00	41 00	60 00	75 00	115 00	168 00
Expansion Joints, I. B.	Sed.	7 00	8 00	10 00	14 00	18 00	30 00	38 00	40 00	70 00	100 00	225 00
"	Flg'd	15 00	16 00	18 50	25 00	30 00	40 00	48 00	55 00	80 00	110 00	250 00
"	Sed.	11 00	13 00	17 50	25 00	30 00	40 00	45 00	55 00	70 00	100 00	225 00
"	Flg'd	18 00	20 00	25 00	35 00	40 00	50 00	55 00	65 00	80 00	110 00	250 00
Jenkin's Disc Horz. Check Valves	Sed.	10 50	14 00	17 00	20 00	25 00	30 00	30 00	40 00	55 00	70 00	160 00
"	Flg'd	12 50	16 50	20 00	23 00	28 00	33 00	33 00	43 00	58 00	73 00	168 00
Standard Gate I. B., Plain	Sed.	10 00	11 50	14 00	17 00	19 00	24 00	27 50	32 50	45 00	54 00	125 00
"	Flg'd	12 00	13 50	16 50	19 50	23 00	28 00	31 50	36 50	49 00	58 00	133 00
"	Sed.	17 50	19 00	22 00	25 00	30 00	37 00	42 00	48 00	64 00	80 00	160 00
"	Flg'd	19 50	21 00	24 50	27 50	34 00	41 00	46 00	52 00	68 00	84 00	168 00

The above list Standard for Kerr Keystone & Jenkins Type K.

CAST IRON FITTINGS

Sizes.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Elbows, C. I.	c.	c.	c.	c.	c.	c.	c.	\$	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
" Reducing	05	06	08	10 1/4	16	20	28	32	50	75	1 05	1 20	1 75	2 00	2 75	4 70	6 75	9 00	13 50	20 00
" R. and L.	07	09	12	18	23	32	32	32	60	85	1 20	1 40	2 00	2 30	3 15	5 40	7 75	10 50	15 50	23 00
" 45°	07	09	12	18	23	32	32	32	60	85	1 25	1 45	2 20	2 50	3 45	5 90	8 50	11 25	17 00	25 00
Tees	09	12	15	23	29	41	47	47	73	1 10	1 50	1 75	2 55	3 00	4 00	6 80	9 75	13 00	19 50	29 00
" Reducing	10	14	17	27	33	47	47	47	83	1 25	1 75	2 00	2 95	3 50	1 60	7 80	11 25	15 00	22 50	33 50
Crosses	16	22	27	42	53	75	75	75	1 30	2 00	2 70	3 15	4 60	5 50	7 25	12 25	17 50	23 50	35 00	52 50
" Reducing	18	25	30	46	60	83	83	83	1 45	2 20	3 00	3 50	5 00	6 00	8 00	13 50	19 25	26 00	38 50	58 00
Return Bends, Close	18	20	22	28	40	57	57	57	1 20	1 70	2 00	2 50	3 00	3 50	4 00	6 80	9 75	13 00	19 50	29 00
" Open	26	30	36	40	55	80	80	80	1 35	2 50	3 00	3 50	5 00	6 00	8 00	13 50	19 25	26 00	38 50	58 00
" Pitched	26	30	36	40	55	80	80	80	1 35	2 50	3 00	3 50	5 00	6 00	8 00	13 50	19 25	26 00	38 50	58 00
Caps, C. I.	05	06	07	10	13	17	21	28	40	60	85	1 00	1 50	1 65	2 40	3 25	4 25	5 50	7 50	10 00
Reducers, C. I.	02	02	03	04	05	07	10	15	18	25	38	42	65	88	1 20	1 85	2 75	3 25	3 75	5 00
" Eccentric, C. I.	04	04	06	08	10	14	20	36	50	80	1 00	1 35	1 85	2 00	2 70	5 35	6 75	8 35	10 00	15 00
Locknuts, C. I.	05	06	07	10	13	17	21	28	40	60	85	1 00	1 50	1 65	2 40	3 25	4 25	5 50	7 50	10 00
Couplings, W. I.	05	06	07	10	13	17	21	28	40	60	85	1 00	1 50	1 65	2 40	3 25	4 25	5 50	7 50	10 00
Hexagon R. & L. Nipples	05	06	07	10	13	17	21	28	40	60	85	1 00	1 50	1 65	2 40	3 25	4 25	5 50	7 50	10 00
Plugs, R. H.	02	02	03	04	05	07	10	15	18	25	38	42	65	88	1 20	1 85	2 75	3 25	3 75	5 00
" Left	04	04	06	08	10	14	20	36	50	80	1 00	1 35	1 85	2 00	2 70	5 35	6 75	8 35	10 00	15 00
" R. H., Galvanized	04	04	06	08	10	14	20	36	50	80	1 00	1 35	1 85	2 00	2 70	5 35	6 75	8 35	10 00	15 00
" Solid	04	04	06	08	10	14	20	36	50	80	1 00	1 35	1 85	2 00	2 70	5 35	6 75	8 35	10 00	15 00
" Countersunk	04	04	06	08	10	14	20	36	50	80	1 00	1 35	1 85	2 00	2 70	5 35	6 75	8 35	10 00	15 00
Bushings, R. H.	04	04	05	06	07	09	14	28	42	60	80	1 00	1 50	2 00	2 75	4 25	5 75	7 25	8 75	10 25
" Left	08	08	10	12	14	18	28	42	60	80	1 00	1 50	2 00	2 75	4 25	5 75	7 25	8 75	10 25	11 75
" R. H., Galvanized	08	08	10	12	14	18	28	42	60	80	1 00	1 50	2 00	2 75	4 25	5 75	7 25	8 75	10 25	11 75
" Faced	08	09	11	13	17	22	32	48	70	1 20	1 50	2 10	2 60	3 75	5 25	7 25	9 25	11 25	13 25	15 25
O/S Division Tees	06	07	08	10	12	14	18	28	42	60	80	1 00	1 50	2 00	2 75	4 25	5 75	7 25	8 75	10 25
Eureka Circulating Tees	06	07	08	10	12	14	18	28	42	60	80	1 00	1 50	2 00	2 75	4 25	5 75	7 25	8 75	10 25
Range Boiler Couplings	06	07	08	10	12	14	18	28	42	60	80	1 00	1 50	2 00	2 75	4 25	5 75	7 25	8 75	10 25
Crossovers, Black	20	30	45	60	80	1 00	1 20	1 50	2 00	2 50	3 00	3 50	4 00	4 50	5 00	5 50	6 00	6 50	7 00	7 50
" Galvanized	25	40	60	80	1 00	1 20	1 50	2 00	2 50	3 00	3 50	4 00	4 50	5 00	5 50	6 00	6 50	7 00	7 50	8 00
Bushings Eccentric	20	28	34	42	54	66	84	1 08	1 32	1 56	1 80	2 04	2 28	2 52	2 76	3 00	3 24	3 48	3 72	3 96
C. J. Y. Bend	20	28	34	42	54	66	84	1 08	1 32	1 56	1 80	2 04	2 28	2 52	2 76	3 00	3 24	3 48	3 72	3 96

LONG SWEEP WATER FITTINGS

No.	Description	Sizes															
		1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12
		c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
No. 1	Water Elbows, Cl.	32	40	55	80	1 20	2 25	3 25	5 50	8 75	13 00	17 00	25 50	30 00	40 00	50 00	60 00
No. 2	Dbl. Water Elbows	64	80	1 10	1 60	2 40	4 50	6 50	7 00	13 00	17 50	26 00	34 00	51 00	60 00	80 00	100 00
No. 3	Water Tees	48	60	82	1 20	1 80	3 40	4 90	5 25	9 75	13 25	19 50	25 50	38 00	45 00	60 00	80 00
No. 4	Water Crosses	85	1 10	1 50	2 15	3 20	6 00	8 75	9 50	17 50	24 00	35 00	45 00	68 00	80 00	107 00	130 00
No. 1	Water Elbows, Red'g.	48	60	83	1 20	1 80	3 38	4 88	5 25	9 75	13 13	19 50	25 50	38 25	45 00	60 00	80 00
No. 2	Dbl. W. Elbows Red'g.	96	1 20	1 65	2 40	3 60	6 75	9 75	10 50	19 50	26 25	39 00	51 00	76 50	90 00	120 00	150 00
No. 3	W. Tees Red'g.	72	90	1 23	1 80	2 70	5 10	7 35	7 88	14 63	19 88	29 25	38 25	57 00	67 50	90 00	110 00
No. 4	Water Crosses Red'g.	112	1 65	2 25	3 23	4 80	9 00	13 13	14 25	26 25	36 00	52 50	67 50	102 00	120 00	160 50	190 00

STANDARD UNIONS

Size	Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Price	Each	.18	.27	.30	.33	.40	.50	.70	.90	1.15	1.55	2.10	2.85	3.65	4.85	6.50	8.15	10.00	12.00	14.00	16.00	18.00
Price, Galvanized	Each	.27	.40	.45	.50	.60	.75	1.00	1.25	1.60	2.00	2.50	3.25	4.00	5.00	6.25	7.50	9.00	10.50	12.00	14.00	16.00

JEFFERSON OR DART UNIONS

Size	Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Price	Each	.18	.27	.30	.33	.40	.50	.70	.90	1.15	1.55	2.10	2.85	3.65	4.85	6.50	8.15	10.00	12.00	14.00	16.00	18.00
Price, Galvanized	Each	.27	.40	.45	.50	.60	.75	1.00	1.25	1.60	2.00	2.50	3.25	4.00	5.00	6.25	7.50	9.00	10.50	12.00	14.00	16.00

FLANGE UNIONS

Size	Inches	$\frac{3}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	10	12
Standard		.40	.52	.64	.78	1.00	1.25	1.50	1.80	2.10	2.70	3.15	3.95	5.50	7.00	11.50	16.00
Dart			.80	1.20	1.60	2.00	3.20	4.80	6.00	7.50	8.75	10.00	12.50	15.00	18.00	28.80	

### GRABLER RING HANGERS

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	10
Rings only	c. 14	c. 14	c. 16	c. 18	c. 20	c. 22	c. 24	c. 26	c. 30	c. 32	c. 34	c. 36	c. 40	c. 63	c. 88	c. 1.38

### GRABLER STEEL HOOK PLATES

Size	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Number of Hooks to strip	30	30	25	20
Price per strip	\$2.50	\$3.25	\$3.75	\$4.25

### GRABLER BAR, LAG SCREWS AND BEAM CLAMPS

No.	1	2	3	4	5
Size pipe	$\frac{1}{2}$ - $1\frac{1}{2}$	2-3	$3\frac{1}{2}$ -6	7-8	9-12
Bar, 10 ft. Lengths, per foot	.08	.09	.12	.20	.28
Lag Screw, each	.10	.12	.14	.20	.25
Beam Clamp, "	.25	.30	.35	.50	.70

Grabler Bar No. 1,  $\frac{7}{8}$  in.; No. 2, 1 in.; No. 3,  $1\frac{1}{8}$  in.; No. 4,  $1\frac{1}{4}$  in.; No. 5,  $1\frac{5}{8}$  in. wide

### EXPANSION (RING) PIPEHANGERS

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8
Complete	c. 17	c. 18	c. 19	c. 25	c. 29	c. 36	c. 44	c. 55	c. 63	c. 90	c. 1.12	c. 1.35	c. 1.80	c. 2.25
Rings only	.08	.12	.15	.20	.25	.30	.40	.50	.60	.80	1.00	1.25	1.70	2.15
Plates	.08	.08	.08	.09	.09	.10	.10	.10	.10	.10	.10	.10	.10	.10
Buttons	.06	.06	.06	.07	.07	.08	.08	.08	.08	.08	.08	.08	.08	.08

# WROUGHT IRON NIPPLES

## BLACK IRON—RIGHT HAND

Length in inches				Size, inches	Prices		Price of Extra Long Nipples.											
Close	Short	Long	Long or Short		Long	Length in inches												
						4	5	6	7	8	9	10	11	12				
$\frac{3}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$3\frac{1}{2}$	\$ 04	\$ 06	\$ 07	\$ 08	\$ 10	\$ 12	\$ 14	\$ 15	\$ 17	\$ 18	\$ 19			
$\frac{7}{8}$	$1\frac{3}{4}$	2	$2\frac{3}{4}$	$3\frac{3}{4}$	04	06	07	08	10	12	14	15	17	18	19			
1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$3\frac{1}{2}$	04	06	07	08	10	12	14	15	17	18	19			
$1\frac{1}{4}$	$1\frac{3}{4}$	2	$2\frac{3}{4}$	$3\frac{3}{4}$	05	07	08	10	12	14	16	18	20	22	23			
$1\frac{3}{8}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	06	09	11	13	15	17	18	20	22	24	26			
$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	08	13	15	18	20	23	25	28	31	34	36			
$1\frac{5}{8}$	$2\frac{1}{4}$	3	$3\frac{1}{2}$	$4\frac{1}{2}$	11	17	20	24	29	33	36	40	44	47	50			
$1\frac{3}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$4\frac{1}{2}$	13	20	25	29	35	40	45	50	54	59	65			
2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$4\frac{1}{2}$	15	27	32	38	50	54	59	65	72	77	86			
$2\frac{1}{4}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	39	59	68	85	90	97	106	117	126	135				
$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	48	72	85	100	108	120	133	145	158	170				
$2\frac{3}{4}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	75	105	120	140	150	165	180	195	210	225	240			
3	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	85	120	140	160	175	190	205	220	235	250				
$3\frac{1}{4}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	125	170	200	230	255	280	305	330	355	380				
$3\frac{1}{2}$	5	6	$6\frac{1}{2}$	7	155	245	280	320	358	395	430	465	500	535				
$3\frac{3}{4}$	5	6	$6\frac{1}{2}$	8	185	290	340	390	435	480	525	570	615	660				
4	5	6	$6\frac{1}{2}$	9	220	355	410	465	510	560	610	660	710	760				
$4\frac{1}{4}$	5	6	$6\frac{1}{2}$	10	255	400	465	520	575	630	685	740	795	850				
$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	12	290	450	515	575	635	695	755	815	875	935				

Nipples made to order from extra Heavy Pipe at double above list.

WROUGHT IRON NIPPLES  
BLACK IRON—RIGHT AND LEFT

Length in Inches.				Size, Inches	Prices		Prices of Extra Long Nipple.										
Close.	Short.	Long.			Close or Short	Long	Length in Inches.										
							4	5	6	7	8	9	10	11	12		
						\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.		
						09	09	09	11	13	16	18	20	23	25	27	
						09	09	09	11	13	16	18	20	23	25	27	
						09	09	09	11	13	16	18	20	23	25	27	
						11	11	13	16	18	21	24	27	29	29	31	
						....	....	15	17	23	25	27	29	32	32	35	
								20	24	31	33	37	41	45	48		
								27	32	39	45	50	55	60	65		
								34	39	48	52	60	67	72	80		
								43	51	67	72	80	87	96	1 03		
									91	1 20	1 30	1 40	1 55	1 68	1 80		
								1 13	1 44	1 60	1 77	1 93	2 10	2 27	2 45		
								....	1 75	1 95	2 15	2 35	2 55	2 75	3 00		
								....	2 00	2 25	2 50	2 75	3 00	3 25	3 50		

# WROUGHT IRON NIPPLES

## GALVANIZED—RIGHT HAND

Length in Inches.				Prices		Prices of Extra Long Galvanized Nipples.											
Length in Inches.				Prices		Lengths in Inches.											
Close.	Short.	Long.		Sizes, Inches	Close or Short	Long											
							4	5	6	7	8	9	10	11	12		
$\frac{3}{4}$	$\frac{11}{8}$	2	$\frac{21}{8}$	$\frac{1}{8}$	06	11	\$ 12	\$ 15	\$ 17	\$ 21	\$ 24	\$ 26	\$ 29	\$ 31	\$ 34		
$\frac{7}{8}$	$\frac{13}{8}$	2	$\frac{21}{8}$	$\frac{1}{4}$	06	11	12	15	17	21	24	26	29	31	34		
1	$\frac{15}{8}$	2	$\frac{21}{8}$	$\frac{3}{8}$	06	11	12	15	17	21	24	26	29	31	34		
$\frac{11}{8}$	$\frac{17}{8}$	2	$\frac{21}{8}$	$\frac{1}{2}$	06	11	13	16	18	23	26	28	31	33	36		
$\frac{13}{8}$	2	$\frac{21}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	08	14	....	18	21	26	29	32	35	38	41		
$\frac{15}{8}$	$\frac{23}{8}$	3	$\frac{31}{8}$	1	11	19	....	24	28	34	38	42	47	51	55		
$\frac{17}{8}$	$\frac{25}{8}$	3	$\frac{31}{8}$	$1\frac{1}{4}$	17	29	....	32	38	45	51	57	63	69	75		
$\frac{19}{8}$	$\frac{27}{8}$	3	$\frac{31}{8}$	$1\frac{1}{2}$	21	35	....	39	46	55	63	70	77	84	91		
2	$\frac{29}{8}$	3	$\frac{31}{8}$	2	27	47	....	52	61	74	83	93	1 03	1 13	1 23		
$\frac{21}{8}$	3	$\frac{41}{8}$	5	$2\frac{1}{2}$	56	86	....	....	1 00	1 26	1 41	1 56	1 71	1 86	2 01		
$\frac{23}{8}$	3	$\frac{41}{8}$	5	3	70	1 10	....	....	1 30	1 60	1 80	2 00	2 20	2 40	2 60		
$\frac{25}{8}$	4	$\frac{41}{8}$	6	$3\frac{1}{2}$	1 20	1 70	....	....	....	2 10	2 35	2 60	2 85	3 15	3 40		
3	4	$\frac{41}{8}$	6	4	1 35	1 87	....	....	....	2 30	2 60	2 90	3 20	3 50	3 80		
$\frac{27}{8}$	4	$\frac{51}{8}$	6	$4\frac{1}{2}$	1 85	2 60	....	....	....	3 30	3 65	4 05	4 45	4 85	5 25		
$\frac{29}{8}$	4	$\frac{51}{8}$	6	5	2 30	3 15	....	....	....	3 75	4 20	4 60	5 00	5 40	5 85		
$\frac{31}{8}$	$\frac{41}{8}$	5	$\frac{51}{8}$	6	2 80	4 25	....	....	....	4 50	5 00	5 55	6 05	6 60	7 15		
4	5	6	6	7	4 25	....	....	....	....	5 65	6 35	7 05	7 75	8 45	9 20		
4	5	6	6	8	5 00	....	....	....	....	6 65	7 50	8 35	9 25	10 10	10 95		

# WROUGHT IRON NIPPLES GALVANIZED—RIGHT AND LEFT

Length in Inches.				Prices		Price of Extra Long Nipples.											
Length in Inches.				Prices		Length in Inches.											
Close.	Short	Long.		Size, Inches	Close or Short	Long											
					\$ C.	\$ C.	4	5	6	7	8	9	10	11	12	\$ C.	\$ C.
1	1 1/2	2	3	1	08	13	15	18	21	26	29	32	37	40	43		
1	1 1/2	2	3	1 1/4	08	13	15	18	21	26	29	32	37	40	43		
1	1 1/2	2	3	1 1/2	08	13	15	18	21	26	29	32	37	40	43		
1	1 1/2	2	3	1 3/4	11	16	18	21	26	29	34	38	43	46	50		
1	2	2 1/2	3 1/2	2	13	19		24	27	37	40	43	46	51	56		
1 1/2	2	2 1/2	3 1/2	2 1/4	18	29		32	38	50	53	59	66	72	77		
1 1/2	2 1/2	3	4 1/2	2 1/2	24	37		43	51	62	72	80	88	96	1 04		
1 1/2	2 1/2	3	4 1/2	2 3/4	29	43		54	62	77	83	96	1 07	1 51	1 55		
2	2 1/2	3	4 1/2	3	39	57		69	82	1 07	1 15	1 28	1 39	1 54	1 65		
2 1/2	3	4 1/2	5	3 1/2	83	1 25			1 46	1 92	2 08	2 24	2 48	2 69	2 83		
2 1/2	3	4 1/2	5	3 3/4	1 04	1 54			1 81	2 30	2 56	2 83	3 09	3 36	3 63		
2 1/2	4	5 1/2	6	4 1/2	1 60	2 24				2 80	3 12	3 44	3 76	4 08	4 40		
3	4	5 1/2	6	4 3/4	1 84	2 56				3 20	3 60	4 00	4 40	4 80	5 20		

### FLOOR AND CEILING PLATES

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
No. 15 N.P. Steel 2 piece Floor and Ceiling Plates each . . . .	25	26	27	28	32	35	38	45	65	80	1.00	1.25
No. 16 N.P. Steel 1 piece Ceiling Plates with set screw N.P. each . . . . .			12	13	14	15	16	17				
No. 17 N.P. Steel 1 piece Floor Plates N.P. each . . . . .			12	13	14	15	16	17				
C.I. Floor Plates plain each . . . . .			6	6	8	11	14	16	24	30	35	42
C.I. Ceiling Plates plain, each . . . . .			11	13	16	18	23	27	36	50	55	68
Spun Floor Plates N.P., per 100 . . . . .			14	14	18	22	30	35	42	55		
Spun Ceiling Plates set screw N.P., per 100 . . . . .			22	24	26	32	38	46	60	80		

### GALVANIZED TELESCOPIC FLOOR SLEEVES

Size of Pipe	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8
Minimum Length Ins. . . . .	14	14	14	14	14	14	14	14	14	14	14	14
Maximum Length Ins. . . . .	24	24	24	24	24	24	24	24	24	24	24	24
List Price . . . . .	\$ c. 1 05	\$ c. 1 20	\$ c. 1 35	\$ c. 1 50	\$ c. 1 80	\$ c. 2 10	\$ c. 2 50	\$ c. 3 00	\$ c. 3 75	\$ c. 4 50	\$ c. 5 25	\$ c. 6 75

### RING STAYS

Size		$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Short Black . . . . . per 100		\$ c. 5 00	\$ c. 5 00	\$ c. 5 80	\$ c. 7 75	\$ c. 10 00	\$ c. 14 00	\$ c. 22 00
Short Galvanized . . . . .		6 50	6 50	7 00	9 00	12 00	16 00	25 00
Long Black . . . . .		6 50	6 50	8 00	10 00	12 00	15 00	24 00
Long Galvanized . . . . .		8 00	8 00	10 00	12 00	14 00	18 00	27 00

# IMPERIAL RADIATOR COMPANY LIMITED

## SECTIONAL PIPE COVERING STANDARD PRICE LIST

STANDARD THICKNESS						EXTRA THICKNESSES			
Inside Diam. of Pipe	Price per Lineal foot	Elbows	Tees	Crosses	Globe Valves	1½ in. thick per Lineal foot	2 inches thick per Lineal foot	Double Stan. thick per Lineal foot	3 inches thick Broken Joint per Lineal foot
1 ¼ in.	\$ .22	\$ .30	\$ .36	\$ .48	\$ .54	\$ .46	\$ .75	\$ .65	\$ 1.20
1 ½ "	.24	.30	.36	.48	.54	.49	.80	.70	1.35
1 ¾ "	.27	.30	.36	.48	.54	.52	.85	.75	1.40
2 "	.30	.30	.36	.48	.54	.56	.90	.80	1.45
2 ¼ "	.33	.30	.36	.48	.54	.60	.95	.85	1.55
2 ½ "	.36	.36	.42	.54	.60	.64	1.00	.90	1.65
2 ¾ "	.40	.42	.48	.60	.78	.70	1.05	1.00	1.75
3 "	.45	.48	.54	.70	.96	.76	1.15	1.10	1.90
3 ½ "	.50	.54	.60	.80	1.20	.82	1.25	1.20	2.05
4 "	.60	.60	.75	.95	1.50	.88	1.35	1.40	2.20
4 ½ "	.65	.72	.90	1.10	1.85	.94	1.45	1.50	2.35
5 "	.70	.90	1.20	1.50	2.25	1.00	1.55	1.60	2.50
6 "	.80	1.30	1.60	2.00	2.80	1.10	1.70	1.80	2.70
7 "	1.00	1.80	2.20	2.80	3.60	1.20	1.85	2.25	2.90
8 "	1.10	2.40	3.00	3.60	4.40	1.35	2.00	2.50	3.15
9 "	1.20	3.00	3.80	4.40	5.30	1.50	2.20	2.70	3.40
10 "	1.30	3.60	4.60	5.20	6.20	1.65	2.40	2.90	3.65
12 "	1.85	.....	.....	.....	.....	1.85	2.70	4.10	4.10

Above List Prices include the following styles of coverings:

Asbestos Fire—Felt, Magnesite, Vitribestos, Indented, Asbestoce, Air Cell, Eureka, Molded Asbestos, Perfection Wool Felt, Frost Proof, Anti-Sweat, Zero, Standard Brine, Ammonia, and Aqua Wool Felt.

## MISCELLANEOUS COVERINGS, ETC.

	SIZE	½ in.	¾ in.	1 in.
Hair Felt, 300 sq. ft. per roll per 100 sq. ft. ....		\$12.00	\$14.00	\$16.00
Asbestos Cement, per 100 lb. bag .....				\$ 2.50
Mineral Wool, per 50 lb. bag .....				3.00
Asbestos Sheathing, per 100 square feet .....				10.00
Asbestos Wick, per ½ lb. ball .....				50
Candle Wick, per ½ lb. ball .....				25

Sectional Pipe Covering supplied in sections 3' or long.

# COVERING BOILERS WITH ASBESTOS CEMENT

Number of Bags of Asbestos Plaster Required to Cover Boiler 1 1/4, 1 1/2, or 2 in. Thick

NEW KING				ROYAL ROUND				ROYAL SQUARE				ROYAL SMOKELESS			
No.	1 1/4"	1 1/2"	2"	No.	1 1/4"	1 1/2"	2"	No.	1 1/4"	1 1/2"	2"	No.	1 1/4"	1 1/2"	2"
1	1	1	2	4-19	2	2	3	15-4	2	2	3	249	6	7	9
2	2	2	3	5-19	2	3	3	15-5	2	3	4	250	8	9	12
2 1/2	2	2	3	4-22	2	3	4	15-6	3	3	4	251	8	10	13
3	2	2	3	5-22	3	3	4	19-5	3	3	4	338	9	10	14
3 1/2	2	2	3	4-25	3	3	4	19-6	3	4	5	339	9	11	15
4	2	2	3	5-25	3	3	4	19-7	4	4	5	340	10	12	15
4 1/2	2	3	3	4-28	3	3	4	25-5	3	4	5	341	10	12	16
5	2	3	3	5-28	3	3	4	25-6	3	4	5	342	10	12	16
5 1/2	3	3	4	4-31	3	4	5	25-7	4	4	6	343	10	12	16
6	3	3	4	5-31	3	4	5	25-8	5	5	7	344	10	12	16
6 A	3	3	4	4-34	3	4	5	36-5	5	5	8	345	10	12	16
6 1/2	3	4	5	5-34	4	4	5	36-6	6	6	9	346	10	12	17
6 1/2 A	3	4	5					36-7	6	7	10	347	11	13	17
7	3	4	5					36-8	7	8	11	409	10	13	17
7 1/2	4	4	6					36-9	7	9	12	410	10	13	17
8	4	4	6					48-6	8	10	13	411	11	14	18
8 1/2	4	4	6					48-7	9	11	15	412	12	14	19
9	4	4	6					48-8	10	12	16	413	12	15	20
9 1/2	4	5	6					48-9	12	14	18	414	13	16	21
								48-10	14	17	20	548	13	16	22
												549	14	18	24
												550	15	20	25
												551	15	21	25
												552	16	21	26
												553	16	22	26
												554	17	23	28
												555	18	24	30
												556	20	25	30
												557	21	26	30
												558	22	26	32
				"ROYAL" BUNGALOW HEATERS											
				118	18	115	15								
				1 1/2	1 1/2	1	1								

# IMPERIAL RADIATOR COMPANY LIMITED

## MISCELLANEOUS THERMOMETERS AND GAUGES

N.P. Hot Water Thermometer, Straight, each .....	.....
" " " Angle, " .....	.....
" " " Angle, " .....	.....
" Steam Thermometer with temperature and pressure scales, Straight, each .....	.....
" Steam Thermometer with temperature and pressure scales, Angle, each .....	.....
" Hot Water Thermometer, Round Dial, each .....	.....
N.P. Altitude Gauges, 4 1/2 in. diameter, each .....	.....
" Low Pressure Steam Gauges, 4 1/2 inch diameter, each .....	.....

## GAUGE GLASSES

Diam.	Length	10	11	12	13	14	15	16	18	20
1/2 in. ....	each	.25	.27	.30	.32	.35	.37	.40	.45	.50
3/8 in. ....	"	.25	.27	.30	.32	.35	.37	.40	.45	.50
3/4 in. ....	"	.30	.33	.36	.40	.43	.46	.49	.55	.62

## EXPANSION TANKS

Made of Galvanized Iron, complete with Glass and Mountings

SIZE	12x24	12x30	14x30
Tanks complete, each .....	.....	.....	.....
Brass Mountings only—without glass, per set .....	.....	.....	.....
Automatic Expansion Tank, Plain Oak List .....	.....	.....	.....

## SPECIALTIES HONEYWELL GENERATORS

Size	Capacity Radiation Square Feet	Tappings Top	Side	Mercury Contained	Price
No. 1	For 1,200 and less .....	1	3/4	3 lbs.	\$25.00
No. 2	For 1,200 to 2,500 .....	1	1	6 1/2 lbs.	35.00
No. 3	For 2,500 to 3,500 .....	1 1/4	1 1/4	11 lbs.	50.00
No. 4	For 10,000 .....	1 1/4	1 1/4	15 lbs.	65.00
.....	Tank Circulator .....	...	...	.....	4.00

Note.—See page 78 for Honeywell Tappings.

## GUIDE FOR ESTIMATING HOT WATER HEATING SYSTEM

Boiler.  
Twin Headers.  
Radiators (direct, indirect and direct-indirect).  
Special Radiators (Angles, Dining-room Corners, High,  
Casing Indirect Radiators.  
Hanging Indirect Radiators.  
Registers, Galvanized Iron and Tin Work.  
Radiator Slabs and Tops.  
Radiator Valves.  
Air Valves.  
Floor and Ceiling Plates.  
Floor Sleeves.  
Elbows, Tees, Pipe and Nipples.  
Unions, Hangers, etc.  
Blowoff and Supply.  
Covering Boiler and Mains.  
Expansion Tank and Automatic Feed Tank.  
Thermometer and Altitude Gauge.  
Decorating Radiators.  
Smoke Pipe.  
Valves on Mains, Risers and Dryers.  
Hangers for Ceiling Radiators.  
Freight and Cartage.  
Board and Railway Fare.  
Labor.  
Carpenter Work.  
Temporary Heat.

## GUIDE FOR ESTIMATING STEAM SYSTEM

1. Boiler.
2. Twin Headers.
3. Radiators.
4. Thermostatic Radiator Traps.
5. Air Valves.
6. Radiator Valves.
7. Drip Traps.
8. Traps for Vents or Air Vents.
9. Ells, Tees, etc.
10. Unions.
11. Main Valves.
12. Pipe.
13. Main Covering.
14. Material for covering Boiler.
15. Hangers for Ceiling Radiators.
16. Hangers and assorted Nipples.
17. Floor and Ceiling Plates.
18. Blow off and Supply Valves.
19. Blow off Tanks.
20. Brickwork for Boiler setting.
21. Foundations.
22. Return Trap.
23. Condensation Return Trap.
24. Vacuum Pump.
25. Temperature Control.
26. Heater Coils.
27. Fan and Motor.
28. Registers, Galvanized Iron and Tin Work.
29. Wiring, etc.
30. Painting and Decorating.
31. Temporary Heat.
32. Radiator Shields.
33. Carting and Setting Boiler.
34. Smoke Pipe.
35. Local Cartage and Freight.
36. Board and Railway Fares.
37. Incidentals.

# IMPERIAL RADIATOR COMPANY LIMITED

## BRANCH TEES OR HEADERS

Branch Tees for Box Coils are always tapped left hand in branches and right hand in back inlet.

The run and back opening of Branch Tees are tapped the same size as branches, unless otherwise ordered.

No. of Branches	1 IN. BRANCH TEES			1 1/4" BRANCH TEES			1 1/2" BRANCH TEES			2" BRANCH TEES		
	2 3/4 in. Centre to Centre			3 in. Centre to Centre			3 1/2 in. Centre to Centre			4 1/2 in. Centre to Centre		
	1" or 1 1/4 in Run	1 1/2 in Run	2 in. Run	1 3/4 in. or 1 1/2 in Run	2 in. Run	2 1/2 in Run	1 1/2 in or 2" Run	2 1/2 in. Run	3 in. Run	2 in. Run	2 3/4 in. or 3" Run	3 1/2 in. Run
2	.90	1.00	1.15									
3	1.05	1.15	1.35	1.65	1.90	2.40	2.70	3.45	3.80	5.25	6.75	6.25
4	1.15	1.30	1.60	2.00	2.40	2.85	3.35	4.15	4.60	6.40	7.00	7.75
5	1.35	1.45	1.85	2.40	2.90	3.55	4.00	5.00	5.50	7.65	8.50	9.25
6	1.60	1.75	2.10	2.80	3.30	3.95	4.65	5.75	6.25	8.80	9.75	10.75
7	1.90	2.20	2.45	3.20	3.90	4.20	5.25	6.50	7.25	10.60	11.75	13.00
8	2.20	2.45	2.75	3.60	4.50	4.95	5.85	7.00	7.75	11.50	12.75	14.00
9	2.65	2.90	3.40	4.30	5.25	6.15	6.50	8.25	9.00	12.25	13.50	15.00
10		3.30	4.00	4.80	5.85	6.85	7.60	9.25	10.00	13.50	15.00	16.50
11		4.50	4.80	5.00	6.25	7.25	8.00	9.75	10.75			
12		4.75	5.10	5.25	6.50	7.65	8.50	10.50	11.40			
13		5.50	6.00	6.00	7.00	8.25						
14		7.00	7.25	6.75	7.75	9.00						
15		7.50	7.75	7.50	8.50	9.75						
16		8.00	8.25	8.50	9.50	10.75						

NOTE:—1 inch Branch Tees, 1 inch or 1 1/4 inch run, are 1 1/4 inches inside diameter.

1 inch Branch Tees, 1 1/2 inch or two inch run, are 2 1/4 inches inside diameter.

1 1/4 inch Branch Tees are all 2 1/2 inches inside diameter.

1 1/2 inch Branch Tees are all 2 3/4 inches inside diameter.

2 inch Branch Tees are all 3 1/2 inches inside diameter.

Always order Branch Tees by size and number.

Above prices are for end outlets only, back or side outlets charged as additional front outlets.

## CAST IRON HOOK AND RING PLATES

NUMBER OF BRANCHES		1	2	3	4	5	6	7	8	9	10	11	12
HOOK PLATES		c.	c.	c.	c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1" pipe, 2 1/2" centre to centre		09	18	23	26	32	38	48	59	65	75	85	1 00
1 1/4" " 3 " " "		10	21	27	32	41	52	68	80	90	1 00	1 35	1 40
1 1/2" " 3 1/2" " " "		15	28	43	58	72	88	1 10	1 25	1 40	1 55	1 65	1 90
2" " 4 1/2" " " "		22	43	65	90	1 15	1 35	....	....	....	....	....	....
RING PLATES													
1 in. pipe, 2 1/2" centre to centre		16	28	41	50	62	72	96	1 00	....	....	....	....
1 1/4" " 3 " " "		21	35	5	62	75	1 10	1 25	1 40	....	....	....	....

# CUTTING PIPE TO LENGTH "EXTRA"

## PRICE LIST

Lengths 6 ft. and under 16 ft.			2 ft. and under 6 ft.		1 ft. and under 2 ft.	
Size	Black	Galv'd	Black	Galv'd	Black	Galv'd
$\frac{1}{4}"$ & $\frac{3}{8}"$	\$ 0.60	\$ 0.90	\$ 0.80	\$ 1.20	\$ 1.00	\$ 1.50
$\frac{1}{2}"$	.80	1.00	1.10	1.30	1.30	1.70
$\frac{3}{4}"$	1.20	1.30	1.50	1.70	1.90	2.10
1"	1.40	1.90	2.00	2.50	2.40	3.20
1 $\frac{1}{4}"$	2.00	2.60	2.60	3.40	3.30	4.30
1 $\frac{1}{2}"$	2.40	3.10	3.20	4.10	3.90	5.10
2"	3.20	4.10	4.20	5.50	5.30	6.90
2 $\frac{1}{2}"$	5.10	6.60	6.80	8.80	8.50	11.00
3"	6.70	8.60	8.90	11.50	11.10	14.40
3 $\frac{1}{2}"$	8.30	10.60	11.00	14.20	13.80	17.70
4"	9.80	12.60	13.10	16.80	16.30	21.00
4 $\frac{1}{2}"$	11.50	15.00	15.50	20.00	19.50	25.00
5"	13.50	17.50	18.00	23.50	22.50	29.50
6"	17.50	23.00	23.50	30.50	29.00	38.00
7"	23.00	29.50	31.00	39.50	38.50	49.50
8"	28.00	36.00	37.00	48.00	47.00	60.00

## PRICE LIST—THREADS ONLY

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Threads, ea.	.06	.06	.06	.06	.06	.06	.08	.10	.14	.20	.30
Size	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6	7	8	9	10	11	12
Threads, ea.	.40	.40	.50	.60	.90	1.10	1.20	2.00	2.50	3.50	3.50

Cuts—two-thirds of above price. Add 50 per cent. for left hand threads.

# CAST IRON COMPANION FLANGES PRICE LIST

## Standard

For Working Pressure up to 125 lbs.

## Extra Heavy

For Working Pressure up to 250 lbs.

Size Inches	Threaded		Blind		Reducing		Size Inches	Threaded		Blind		Reducing	
	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each		Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each
1 x 4	\$0 55	\$0 80					1 x 4 1/2	\$0 95	\$1 30				
1 1/4 x 4 1/2	60	85					1 1/4 x 5	1 00	1 35				
1 1/2 x 5	65	90					1 1/2 x 6	1 10	1 45				
2 x 6	75	1 00	1 15	1 40	1 30	1 55	2 x 6 1/2	1 25	1 60	1 65	2 00	1 80	2 15
2 1/2 x 7	85	1 10	1 30	1 55	1 45	1 70	2 1/2 x 7 1/2	1 40	1 75	2 10	2 45	2 10	2 45
3 x 7 1/2	95	1 25	1 40	1 70	1 55	1 85	3 x 8 1/4	1 60	2 05	2 40	2 85	2 30	2 65
3 1/2 x 8 1/2	1 20	1 55	1 80	2 15	2 00	2 35	3 1/2 x 9	2 00	2 55	3 00	3 55	2 65	3 10
4 x 9	1 35	1 80	2 00	2 45	2 20	2 65	4 x 10	2 25	2 95	3 35	4 05	3 30	3 85
4 1/2 x 9 1/4	1 45	1 90	2 20	2 65	2 40	2 85	4 1/2 x 10 1/2	2 40	3 10	3 60	4 30	3 70	4 40
5 x 10	1 60	2 05	2 40	2 85	2 65	3 10	5 x 11	2 65	3 35	4 00	4 70	4 00	4 70
6 x 11	2 00	2 50	3 00	3 50	3 30	3 80	6 x 12 1/2	3 30	4 05	5 00	5 75	5 50	6 25
7 x 12 1/2	2 65	3 25	4 00	4 60	4 40	5 00	7 x 14	4 40	5 30	6 60	7 50	7 25	8 15
8 x 13 1/2	3 10	3 80	4 60	5 30	5 10	5 80	8 x 15	5 10	6 15	7 65	8 70	8 40	9 45
9 x 15	3 85	4 65	5 75	6 55	6 35	7 15	9 x 16 1/4	6 30	7 50	9 50	10 70	10 50	11 70
10 x 16	4 50	5 50	6 75	7 75	7 45	8 45	10 x 17 1/2	7 40	8 90	11 00	12 50	12 00	13 50
12 x 19	6 50	7 65	9 75	10 90	10 75	11 90	12 x 20 1/2	10 75	12 50	16 00	17 75	17 50	19 25
14 x 21	9 00	10 35	13 50	14 85	15 00	16 35	14 x 23	15 00	17 00	22 50	24 50	25 00	27 00
15 x 22 1/4	11 50	13 20	17 00	18 70	19 00	20 70	15 x 24 1/2	19 00	21 50	28 50	31 00	31 50	34 00
16 x 23 1/2	13 50	15 30	20 00	21 50	22 00	23 50	16 x 25 1/2	22 25	25 00	33 50	36 25	37 00	39 75
18 x 25	16 00	18 00	24 00	26 00	26 50	28 50	18 x 28	26 00	29 00	39 00	42 00	43 00	46 00
20 x 27 1/2	19 00	21 50	28 00	30 50	31 00	33 50	20 x 30 1/2	31 00	35 00	46 00	50 00	51 00	55 00
22 x 29 1/2	22 00	25 00	33 00	36 00	36 00	39 00	22 x 33	36 00	41 00	54 00	59 00	60 00	65 00
24 x 33	27 00	30 50	40 00	43 50	44 00	47 50	24 x 36	45 00	50 00	67 00	72 00	74 00	79 00

All reducing flanges of same outside diameter  
take same prices.

All reducing flanges of same outside diameter  
take same prices.

# FLOOR FLANGES

Sizes of Pipe.	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12
3.....each	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.
3 1/2.....	10	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
4.....	10	15	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
4 1/2.....	10	15	30	25	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
5.....	10	15	30	30	30	30	35	35	35	35	35	35	35	35	35	35	35	35	35
5 1/2.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
6.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
6 1/2.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
7.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
7 1/2.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
8.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
8 1/2.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
9.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
9 1/2.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
10.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
11.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
12.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
12 1/2.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
13.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
13 1/2.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
14.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
15.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
16.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
17.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
18.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
19.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42
20.....	10	15	30	42	40	40	42	42	42	42	42	42	42	42	42	42	42	42	42

DIAMETER OF FLANGES, INCHES.

# TEMPLATES FOR DRILLING FLANGED VALVES AND FLANGED FITTINGS

Size Inches	Low Pressure and Standard						Extra Heavy					
	Diameter of Flanges	Thick'ns of Flanges	Bolt Circle	Number of Bolts	Size of Bolts	Bolt Lengths	Diameter of Flanges	Thick'ns of Flanges	Bolt Circle	Number of Bolts	Size of Bolts	Bolt Lengths
1	4	$\frac{7}{16}$	3	4	$\frac{7}{16}$	$1\frac{1}{2}$	$4\frac{1}{2}$	$\frac{1}{8}$	$3\frac{1}{4}$	4	$\frac{1}{2}$	2
$1\frac{1}{4}$	$4\frac{1}{2}$	$\frac{1}{2}$	$3\frac{3}{8}$	4	$\frac{7}{16}$	$1\frac{1}{2}$	5	$\frac{3}{4}$	$3\frac{3}{4}$	4	$\frac{1}{2}$	$2\frac{1}{4}$
$1\frac{1}{2}$	5	$\frac{9}{16}$	$3\frac{7}{8}$	4	$\frac{1}{2}$	$1\frac{3}{4}$	6	$\frac{1}{2}$	$4\frac{1}{2}$	4	$\frac{5}{8}$	$2\frac{1}{2}$
2	6	$\frac{5}{8}$	$4\frac{3}{4}$	4	$\frac{5}{8}$	2	$6\frac{1}{2}$	$\frac{7}{8}$	5	4	$\frac{5}{8}$	$2\frac{1}{2}$
$2\frac{1}{2}$	7	$\frac{1}{2}$	$5\frac{1}{2}$	4	$\frac{5}{8}$	$2\frac{1}{4}$	$7\frac{1}{2}$	1	$5\frac{1}{8}$	4	$\frac{3}{4}$	3
3	$7\frac{1}{2}$	$\frac{3}{4}$	6	4	$\frac{5}{8}$	$2\frac{1}{2}$	$8\frac{1}{4}$	$1\frac{1}{8}$	$6\frac{5}{8}$	8	$\frac{3}{4}$	$3\frac{1}{4}$
$3\frac{1}{2}$	$8\frac{1}{2}$	$\frac{1}{2}$	7	4	$\frac{5}{8}$	$2\frac{1}{2}$	9	$1\frac{3}{8}$	$7\frac{1}{4}$	8	$\frac{3}{4}$	$3\frac{1}{4}$
4	9	$\frac{1}{2}$	$7\frac{1}{2}$	8	$\frac{5}{8}$	$2\frac{3}{4}$	10	$1\frac{1}{4}$	$7\frac{7}{8}$	8	$\frac{3}{4}$	$3\frac{1}{2}$
$4\frac{1}{2}$	$9\frac{1}{4}$	$\frac{1}{2}$	$7\frac{3}{4}$	8	$\frac{3}{4}$	3	$10\frac{1}{2}$	$1\frac{5}{16}$	$8\frac{1}{2}$	8	$\frac{3}{4}$	$3\frac{1}{2}$
5	10	$\frac{1}{2}$	$8\frac{1}{2}$	8	$\frac{3}{4}$	3	11	$1\frac{3}{8}$	$9\frac{1}{4}$	8	$\frac{3}{4}$	$3\frac{3}{4}$
6	11	1	$9\frac{1}{2}$	8	$\frac{3}{4}$	3	$12\frac{1}{2}$	$1\frac{7}{16}$	$10\frac{5}{8}$	12	$\frac{3}{4}$	$3\frac{3}{4}$
7	$12\frac{1}{2}$	$1\frac{1}{16}$	$10\frac{3}{4}$	8	$\frac{3}{4}$	3	14	$1\frac{1}{2}$	$11\frac{7}{8}$	12	$\frac{7}{8}$	4
8	$13\frac{1}{2}$	$1\frac{1}{8}$	$11\frac{3}{4}$	8	$\frac{3}{4}$	$3\frac{1}{4}$	15	$1\frac{5}{8}$	13	12	$\frac{7}{8}$	$4\frac{1}{4}$
9	15	$1\frac{1}{8}$	$13\frac{1}{4}$	12	$\frac{3}{4}$	$3\frac{1}{4}$	$16\frac{1}{4}$	$1\frac{3}{4}$	14	12	1	$4\frac{3}{4}$
10	16	$1\frac{3}{16}$	$14\frac{1}{4}$	12	$\frac{7}{8}$	$3\frac{1}{2}$	$17\frac{1}{2}$	$1\frac{7}{8}$	$15\frac{1}{4}$	16	1	5
12	19	$1\frac{1}{4}$	17	12	$\frac{7}{8}$	$3\frac{3}{4}$	20	2	$17\frac{3}{4}$	16	1	$5\frac{1}{4}$
14	21	$1\frac{3}{8}$	$18\frac{3}{4}$	12	1	$4\frac{1}{4}$	$22\frac{1}{2}$	$2\frac{1}{8}$	20	20	1	$5\frac{1}{2}$
15	$22\frac{1}{4}$	$1\frac{3}{8}$	20	16	1	$4\frac{1}{4}$	$33\frac{1}{2}$	$2\frac{3}{16}$	21	20	$1\frac{1}{8}$	$5\frac{3}{4}$
16	$23\frac{1}{2}$	$1\frac{7}{16}$	$21\frac{1}{4}$	16	1	$4\frac{1}{4}$	25	$2\frac{1}{4}$	$22\frac{1}{2}$	20	$1\frac{1}{8}$	6

Effective October 1, 1912.

# CAST IRON FLANGED FITTINGS

For Working Pressure up to 125 lbs. Standard

## PRICE LIST

Size Inches	Elbows, 90°		Elbows, 45°		Elbows, Reducing		Elbows, Long Radius		Elbows, With Base		Facing and Drilling Base Flange each
	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	
1 1/4	5 3 00	\$ 3 60	\$ 3 30	\$ 3 90							
1 1/2	3 30	3 60	3 30	3 90							
2	3 00	3 60	3 30	3 90			5 00	5 90			
2 1/2	3 15	3 75	3 50	4 10			5 25	6 15			
3	3 45	4 15	3 80	4 50	6 90	7 60	5 75	6 85			
3 1/2	4 05	4 90	4 50	5 35	3 10	8 95	6 75	8 00			
4	4 50	5 50	5 00	6 00	9 00	10 00	7 50	9 00	9 00	10 00	3 00
4 1/2	5 50	6 50	6 00	7 00	11 00	12 00	9 25	10 75	11 00	12 00	3 00
5	6 25	7 25	6 90	7 90	12 50	13 50	10 50	12 00	12 50	13 50	3 50
6	7 60	8 90	8 35	9 65	15 25	16 55	12 65	14 60	15 25	16 55	3 50
7	10 50	12 00	11 00	12 50	21 00	22 50	17 50	19 75	21 00	22 50	3 50
8	12 00	13 60	12 60	14 20	24 00	25 60	20 00	22 40	24 00	25 60	5 00
9	17 00	19 25	17 75	20 00	34 00	36 25	28 50	31 85	34 00	36 25	5 00
10	19 00	21 70	20 00	22 70	38 00	40 70	31 50	35 50	38 00	40 70	5 00
12	28 00	31 00	29 50	32 50	56 00	59 00	46 50	51 00	56 00	59 00	7 50
14	41 50	45 25	41 50	45 25	70 00	73 75	69 00	74 50	70 00	73 75	7 50
15	47 00	51 50	47 00	51 50	80 00	84 50	78 00	84 75	80 00	84 50	7 50
16	54 50	59 50	54 50	59 50	90 00	95 00	91 00	98 50	90 00	95 00	7 50
18	71 00	77 00	71 00	77 00	105 00	111 00	118 00	127 00	105 00	111 00	12 00
20	90 00	97 00	90 00	97 00	120 00	127 50	150 00	160 00	120 00	127 00	12 00
22	113 00	122 00	113 00	122 00	150 00	159 00	189 00	202 00	150 00	159 00	12 00
24	140 00	150 00	140 00	150 00	190 00	200 00	233 00	248 00	190 00	200 00	12 00

**Standard Flanged Taper Reducers, also Special Fittings are made to order. Prices on application.**

Sizes not listed will be charged as specials. When ordering reducing flanged fittings always state whether they may be reduced by a flange if the regular fittings are not in stock.

# CAST IRON FLANGED FITTINGS

For Working Pressure up to 125 lbs. Standard

## PRICE LIST

Size ins.	TEES			CROSSES			LATERALS		
	Straight		Reducing	Straight		Reducing	Straight		Reducing
	Faced each	Faced and Drilled each	Faced each Drilled each	Faced each	Faced and Drilled each	Faced each Drilled each	Faced each	Faced and Drilled each	Faced each Drilled each
1 1/4	\$4 35	\$ 5 25	5 90	\$ 6 75	\$ 7 95	8 95	\$ 6 75	\$ 7 95	8 95
1 1/2	4 35	5 25	5 90	6 75	7 95	8 95	6 75	7 95	8 95
2	4 35	5 25	5 90	6 75	7 95	8 95	6 75	7 95	8 95
2 1/2	4 55	5 45	6 15	6 95	8 15	9 20	6 95	8 15	9 20
3	5 00	6 10	6 85	7 65	9 05	10 15	7 65	9 05	10 15
3 1/2	5 85	7 10	8 00	9 00	10 70	12 05	9 00	10 70	12 05
4	6 50	8 00	9 00	10 00	12 00	13 50	10 00	12 00	13 50
4 1/2	8 00	9 50	10 75	12 00	14 00	15 75	12 00	14 00	15 75
5	9 10	10 60	12 00	13 75	15 75	17 75	13 75	15 75	17 75
6	11 00	12 95	14 60	16 75	19 25	21 75	16 75	19 25	21 75
7	15 25	17 50	19 75	23 00	26 00	29 50	23 00	26 00	29 50
8	17 40	19 80	22 40	26 50	29 75	33 75	26 50	29 75	33 75
9	24 65	28 00	31 85	37 50	42 00	47 50	37 50	42 00	47 50
10	27 50	31 50	35 50	42 00	47 50	53 50	42 00	47 50	53 50
12	40 50	45 00	51 00	61 50	67 50	77 00	61 50	67 50	77 00
14	60 00	65 50	74 50	91 00	98 50	112 50	91 00	98 50	112 50
15	68 00	74 75	84 75	103 00	112 00	127 00	103 00	112 00	127 00
16	79 00	86 50	98 50	120 00	130 00	148 00	120 00	130 00	148 00
18	103 00	112 00	127 00	157 00	169 00	192 00	157 00	169 00	192 00
20	130 00	140 00	160 00	198 00	212 00	242 00	198 00	212 00	242 00
22	164 00	177 00	202 00	248 00	266 00	303 00	248 00	266 00	303 00
24	203 00	218 00	248 00	310 00	330 00	375 00	310 00	330 00	375 00

**Standard Flanged Taper Reducers, also Special Fittings are made to order. Prices on application.**

Sizes not listed will be charged as specials. When ordering reducing flanged fittings always state whether they may be reduced by a flange if the regular fittings are not in stock.

# CAST IRON FLANGED FITTINGS

For Working Pressure up to 250 lbs. Extra Heavy

## PRICE LIST

Size Inches	Elbows, 90°		Elbows, 45°		Elbows, Reducing		Elbows, Long Radius		Elbows, With Base		Facing and Drilling Base Flange each
	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	
1 1/4	\$ 4 50	\$ 5 40	\$ 5 00	\$ 5 90	9 00	9 90	7 50	8 85	9 00	9 90	
1 1/2	4 50	5 40	5 00	5 90	9 50	10 40	8 00	9 35	9 50	10 40	
2	4 50	5 40	5 00	5 90	10 25	11 35	8 60	10 25	10 25	11 35	
2 1/2	4 75	5 65	5 25	6 15	10 25	11 35	10 25	12 15	12 25	13 50	
3	5 15	6 25	5 65	6 75	12 25	13 50	10 25	13 50	13 50	15 00	
3 1/2	6 10	7 35	6 75	8 00	13 50	15 00	11 25	16 00	16 50	18 00	4 50
4	6 75	8 25	7 50	9 00	16 50	18 00	13 75	17 75	18 75	20 25	4 50
4 1/2	8 25	9 75	9 00	10 50	18 75	20 25	15 50	22 00	22 75	24 75	5 25
5	9 35	10 85	10 35	11 85	22 75	24 75	19 00	29 85	31 50	33 75	5 25
6	11 40	13 40	12 50	14 50	31 50	33 75	26 50	33 75	36 00	38 50	7 50
7	15 75	18 00	16 50	18 75	36 00	38 50	30 00	47 50	51 00	54 35	7 50
8	18 00	20 50	19 00	21 50	51 00	54 35	42 50	53 75	57 00	61 00	7 50
9	25 50	28 85	26 75	30 10	57 00	61 00	47 75	76 75	84 00	88 50	11 00
10	28 50	32 50	30 00	34 00	84 00	88 50	70 00	111 75	105 00	110 50	11 00
12	42 00	46 50	44 00	48 50	105 00	110 50	103 50	127 00	120 00	127 00	11 00
14	62 00	67 50	62 00	67 50	120 00	127 00	117 00	149 00	135 00	143 00	11 00
15	70 00	77 00	70 00	77 00	135 00	143 00	137 00	191 00	157 00	166 00	18 00
16	82 00	90 00	82 00	90 00	157 00	166 00	177 00	240 00	180 00	190 00	18 00
18	106 00	115 00	106 00	115 00	180 00	190 00	225 00	305 00	225 00	238 00	18 00
20	135 00	145 00	135 00	145 00	225 00	238 00	285 00	373 00	285 00	300 00	18 00
22	170 00	183 00	170 00	183 00	285 00	300 00	350 00				
24	210 00	225 00	210 00	225 00							

Sizes not listed will be charged at special discount.

When ordering reducing flanged fittings always state whether they may be reduced by a flange if the regular fittings are not in stock.

# CAST IRON FLANGED FITTINGS

For Working Pressure up to 250 lbs. Extra Heavy

## PRICE LIST

Size	TEES			CROSSES			LATERALS			
	Straight		Reducing		Straight		Straight		Reducing	
	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each	Faced each	Faced and Drilled each
1 1/4	\$ 6 50	\$ 7 85	7 50	8 85	\$10 00	\$11 80	\$10 00	\$11 80	.....	.....
1 1/2	6 50	7 85	7 50	8 85	10 00	11 80	10 00	11 80	.....	.....
2	6 50	7 85	7 50	8 85	10 00	11 80	10 00	11 80	11 50	13 30
2 1/2	6 90	8 25	8 00	9 35	10 50	12 30	10 50	12 30	12 00	13 80
3	7 50	9 15	8 60	10 25	11 50	13 75	11 50	13 75	13 25	15 50
3 1/2	8 90	10 80	10 25	12 15	13 50	16 00	13 50	16 00	15 50	18 00
4	9 75	12 00	11 25	13 50	15 00	18 00	15 00	18 00	17 00	20 00
4 1/2	12 00	14 25	13 75	16 00	18 00	21 00	18 00	21 00	21 00	24 00
5	13 50	15 75	15 50	17 75	20 50	23 50	20 50	23 50	23 50	26 50
6	16 50	19 50	19 00	22 00	25 00	29 00	25 00	29 00	29 00	33 00
7	23 00	26 35	26 50	29 85	35 00	39 50	35 00	39 50	40 00	44 50
8	26 00	29 75	30 00	33 75	40 00	45 00	40 00	45 00	46 00	51 00
9	37 00	42 00	42 50	47 50	56 00	62 75	56 00	62 75	65 00	71 75
10	41 50	47 50	47 75	53 75	63 00	71 00	63 00	71 00	72 00	80 00
12	61 00	67 75	70 00	76 75	92 00	101 00	92 00	101 00	106 00	115 00
14	90 00	98 25	103 50	111 75	136 00	147 00	136 00	147 00	158 00	169 00
15	102 00	112 00	117 00	127 00	155 00	169 00	155 00	169 00	177 00	191 00
16	119 00	131 00	137 00	149 00	180 00	196 00	180 00	196 00	207 00	223 00
18	154 00	168 00	177 00	191 00	235 00	253 00	235 00	253 00	270 00	288 00
20	195 00	210 00	225 00	240 00	300 00	320 00	300 00	320 00	345 00	365 00
22	247 00	267 00	285 00	305 00	375 00	401 00	375 00	401 00	430 00	456 00
24	305 00	329 00	350 00	373 00	465 00	495 00	465 00	495 00	535 00	565 00

Extra Heavy Flanged Taper Reducers, also special Fittings are made to order. Prices on application

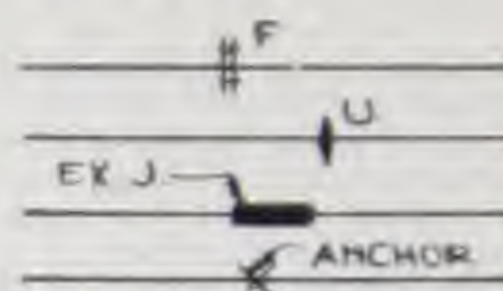
## NOTE

**Refer to the following pages for information:**

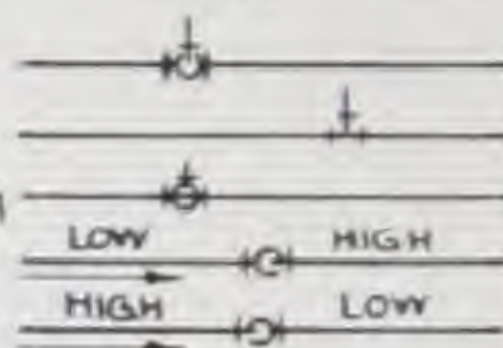
	PAGES
Blue Prints . . . . .	109-110
Mains and Risers—Sizes, etc . . . . .	111-112
Proportioning Radiation . . . . .	113-116
Greenhouse Heating . . . . .	117
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Tables of Capacity, Pressures, etc . . . . .	120-122
Circles—Data, Properties of Saturated Steam, etc . . . . .	123-126 & 135
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Useful Information Concerning Boilers . . . . .	131-134
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## HOW TO READ BLUE PRINTS STANDARD SYMBOLS

FLANGES (BOLTED)  
UNIONS (SCREWED)  
EXPANSION JOINT  
ANCHOR

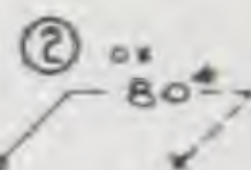


CONNECTIONS TO MAINS { FROM TOP  
FROM SIDE  
FROM BOTTOM



RISE IN MAIN  
DROP IN MAIN

RISER AND RISER NUMBER



1ST FLOOR RADIATOR CONNECTION

GATE VALVE



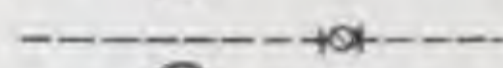
ANGLE VALVE



GLOBE VALVE



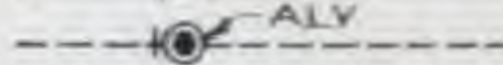
SWING CHECK VALVE



DIAPHRAGM VALVE



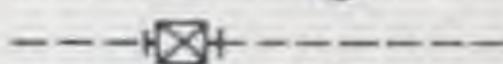
AIR LINE VALVE



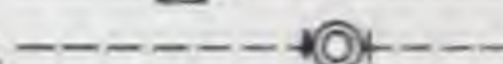
LOW PRESSURE TRAP



HIGH PRESSURE TRAP



AIR VENT OR AIR ELIMINATOR



SUCTION STRAINER



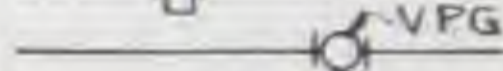
STEAM SEPARATOR



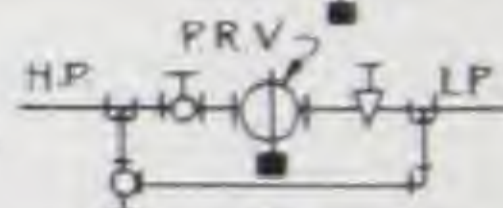
OIL SEPARATOR



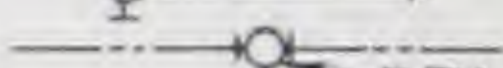
VACUUM PUMP GOVERNOR



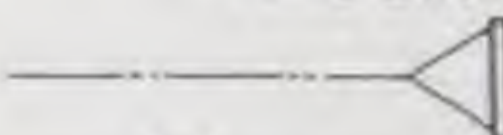
PRESSURE REDUCING VALVE



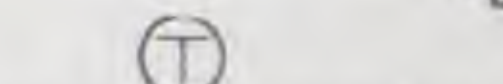
BACK PRESSURE VALVE



EXHAUST HEAD



THERMOSTAT



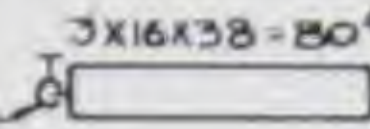

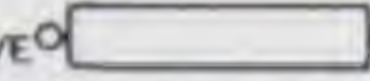
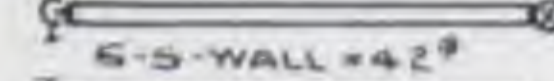
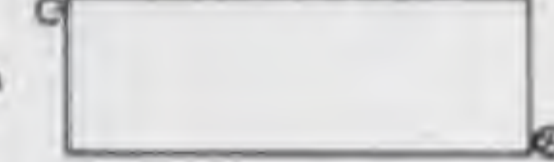

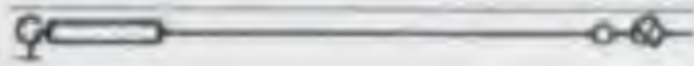

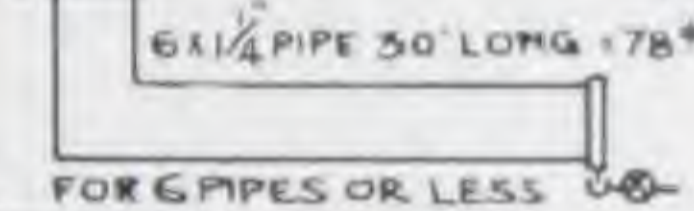
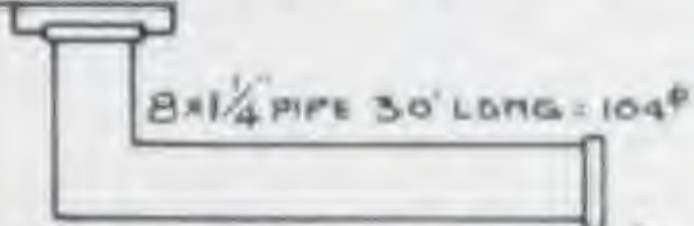
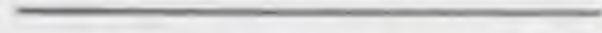



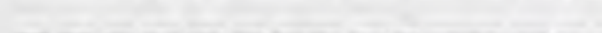
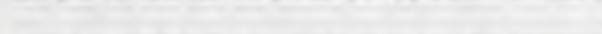



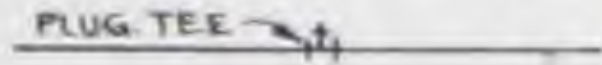
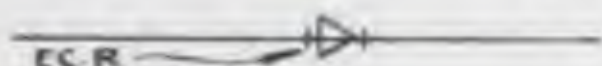
FLOOR REGISTER



HEAT OPENING

VENT OPENING

## HOW TO READ BLUE PRINTS—Continued STANDARD SYMBOLS

NEW RADIATOR	VALVE		3X16X38=80°	TRAP
OLD RADIATOR				
RADIATOR WITH DIAPHRAGM VALVE				
WALL RADIATOR ON WALL			5-5-WALL=42°	
WALL RADIATOR ON CEILING				
WALL RADIATION APPROXIMATE SIZES				
HARP PIPE COIL ON WALL				
CORNER PIPE COIL ON WALL				
HARP PIPE COIL ON CEILING			6X1 1/4 PIPE 30' LONG=78°	
			FOR 6 PIPES OR LESS	
HARP PIPE COIL ON CEILING			8X1 1/4 PIPE 30' LONG=104°	
			FOR 7 PIPES OR MORE	
LOW PRESSURE STEAM				
HIGH PRESSURE STEAM				
EXHAUST STEAM				
OLD STEAM PIPE L.P.				
DRY RETURN PIPE				
OLD RETURN PIPE				
DRY DRIP PIPE				
WET DRIP OR WET RETURN				
OLD DRIP PIPE				
PLUGGED TEE			PLUG TEE	
ECCENTRIC REDUCER			ECR	

# LIST OF SIZES OF HOT WATER MAINS AND SQUARE FEET OF RADIATION

## TABLE OF HOT WATER MAINS AND BRANCHES

Main		Branch	
1 in.	will supply 2	.....	$\frac{3}{4}$ in.
$1\frac{1}{4}$ in.	" 2	.....	1 in.
$1\frac{1}{2}$ in.	" 2	.....	$1\frac{1}{4}$ in.
2 in.	" 2	.....	$1\frac{1}{2}$ in.
$2\frac{1}{2}$ in.	" 2	$1\frac{1}{4}$ in. and 1 $1\frac{1}{4}$ in., or 1 2 in. and 1 $1\frac{1}{4}$ in.	$1\frac{3}{4}$ in.
3 in.	" 1 $2\frac{1}{2}$ in. and 1 2 in., or 2 2 in. and 1 $1\frac{1}{2}$ in.		$1\frac{1}{2}$ in.
$3\frac{1}{2}$ in.	" 2 $2\frac{1}{2}$ in. or 1 3 in., and 1 2 in. or 3 2 in.		2 in.
4 in.	" 1 $3\frac{1}{2}$ in. and 1 $2\frac{1}{2}$ in., or 2 3 in. and 4 2 in.		2 in.
$4\frac{1}{2}$ in.	" 1 $3\frac{1}{2}$ in. and 1 3 in., or 1 4 in. and 1 $2\frac{1}{2}$ in.		$2\frac{1}{2}$ in.
5 in.	" 1 4 in. and 1 3 in., or 1 $4\frac{1}{2}$ in. and 1 $2\frac{1}{2}$ in.		$2\frac{1}{2}$ in.
6 in.	" 2 4 in. and 1 3 in., or 4 3 in. or 10 2 in.		2 in.
7 in.	" 1 6 in. and 1 4 in., or 3 4 in. and 1 2 in.		2 in.
8 in.	" 2 6 in. and 1 5 in., or 5 4 in. and 2 2 in.		2 in.

## TABLE OF HOT WATER RISERS

Size of Riser.	1st Floor.	2nd Floor.	3rd Floor.	4th Floor.	5th Floor.	6th Floor.
1 in.	48 sq. ft.	55 sq. ft.	65 sq. ft.	75 sq. ft.	85 sq. ft.	95 sq. ft.
$1\frac{1}{4}$ in.	60 "	90 "	110 "	125 "	140 "	160 "
$1\frac{1}{2}$ in.	100 "	140 "	165 "	185 "	210 "	240 "
2 in.	200 "	275 "	375 "	425 "	500 "	
$2\frac{1}{2}$ in.	350 "	475 "				
3 in.	550 "					
$3\frac{1}{2}$ in.	850 "					

## HOT WATER RADIATION AND SIZES OF PIPE

Sizes of Pipe, in.		1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Length of main.	100	30	60	100	200	350	550	850	1,200			
	200		50	75	150	250	400	600	850	1,200	1,400	
	300			50	125	200	300	450	700	950	1,150	
	400				100	175	275	400	600		1,000	1,600

# LIST OF SIZES OF STEAM MAINS AND SQUARE FEET OF RADIATION

## CAPACITY OF STEAM RISERS (ONE PIPE)

Size (Inches)	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Capacity L.P. Feed	30	50	100	200	300	400	500	600
Capacity Direct Feed	30	100	100	200	300	500	500	1000

In high buildings with top direct feed systems, the lower half of the Riser should be based on not more than half the capacity shown in lower half of table column is provided for the construction of usual buildings.

## CAPACITY OF STEAM RISERS (TWO PIPE)

Size (Inches)	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Capacity L.P. Feed	30	100	100	200	300	500	1000	2000
Capacity Direct Feed	30	110	100	200	300	1000	1000	2000
Capacity Direct Feed	1/2	1	1-1/4	1-1/2	2-1/4	2-1/2	3-1/2	4-1/2

Over the capacity for 100% rise column in Riser is shown for increased condensing.

## SIZE OF STEAM MAINS (TWO PIPE) FOR MAINS NOT EXCEEDING 100 FEET IN LENGTH

Size of Main	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8
Capacity Direct	30	100	100	200	300	500	1000	1000	2000	2000	3000	4000	5000
Capacity Direct	1/2	1	1 1/4	1 1/2	2	2 1/4	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2
Capacity Direct	1/2	1	1 1/4	1 1/2	2	2 1/4	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2

## SIZE OF ONE PIPE STEAM CIRCUIT MAIN (FOR MAINS OF ORDINARY LENGTH NOT EXCEEDING 100 FEET)

Size of Main	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	7	8	9	10
Capacity Direct	30	100	100	200	300	500	1000	1000	2000	2000	3000	4000	5000

## PROPORTIONING RADIATION HEAT TRANSMISSION RULE

(For figuring radiation for heating by water or steam, to maintain 70 degrees inside)

	Different degrees of outside temperature:				
	20 above zero	10 above zero	Zero	10 below zero	20 below zero
For $\frac{1}{2}$ air change per hour multi- ply the cubic contents by.....	.5	.6	.7	.8	.9
For 1 air change per hour multi- ply the cubic contents by.....	1.0	1.2	1.4	1.6	1.8
For $1\frac{1}{2}$ air change per hour multi- ply the cubic contents by.....	1.5	1.8	2.1	2.4	2.7
For 2 air changes per hour multi- ply the cubic contents by.....	2.0	2.4	2.8	3.2	3.6
Multiply the exposed glass by....	50	65	75	85	95
Multiply the exposed wall by....	17	20	25	27	30

Use the co-efficient for  $\frac{1}{2}$  air change for rooms only requiring tempering.

" " " 1 " " bedrooms.

" " "  $1\frac{1}{2}$  " " living rooms.

" " " 2 " " halls, bath and exposed rooms.

Add the results thus obtained and divide by 160, and the result will be the square feet of direct Hot Water radiation required to heat the room.

Add the results thus obtained and divide by 250, and the result will be the square feet of direct Steam radiation required to heat the room.

## CARPENTER'S RULE

### RULES FOR PROPORTIONING RADIATION

Professor R. C. Carpenter, of Cornell University, submits the following rule for determining the size of radiator needed for a given room.

**RULE:**—Add the area of the glass surface in the room to one-quarter of the exposed wall surface, and to this add from 1-55 to 3-55 of the cubical contents (1-55 for rooms on upper floor, 2-55 for rooms on first and 3-55 for large halls); then for steam multiply by .25 and for water .40.

**EXAMPLE:**—A room 20x12x10 feet, with glass exposure of 48 feet,  $\frac{1}{4}$  of wall exposure, (two sides exposed) 320 feet = 80, 1-55 of 2400 = 44.

$$48 + 80 + 44 = 172 \times .25 = 43 \text{ feet}$$

If you add 2-55 the surface would be 54 feet.

If you add 3-55 the surface would be 65 feet.

## MILLS' RULE

(Quick Method—Not as Reliable)

A very popular and easily remembered formula is the well known Mills' 2-20-200 Rule (Western Canada 2-10-200), in which the total amount of steam radiation required is obtained as follows:—

$$\frac{\text{Glass}}{2} + \frac{\text{Ex. wall}}{20} + \frac{\text{Cu. contents}}{200} = \text{sq. ft. of radiation.}$$

**NOTE:**—This rule does not work out well in the case of halls or rooms having less than ordinary amounts of wall and glass surface, where the opening and closing of outside doors changes the air frequently. In such cases the radiation should be increased 20% or over.

## HANGING INDIRECT STACKS

For cleanliness, as well as for obtaining the best results, Indirect stacks should be hung on one side of the register or warm air flue opening, receiving the warm air duct from the end of the indirect casing close to the top, and the cold air duct at the bottom of the opposite end. A space of ten inches (preferably twelve) should be allowed for warm air above the Stack, and ten inches below for cold air.

## STEAM OR WATER INDIRECT

Square feet in stack.....	50	60	70	80	90	100
Cold Air Duct, first floor, sq. in. in area.....	60	70	80	90	100	110
Cold Air Duct, upper floors, sq. in. in area.....	50	60	70	80	90	100
Warm Air Duct, first floor, sq. in. in area.....	90	100	115	130	145	160
Warm Air Duct, upper floors, sq. in. in area.....	60	70	80	90	100	110
Rectangular Registers, first floor.....	10x14	12x15	12x15	12x19	16x20	16x22
Rectangular Registers, upper floors.....	8x10	9x12	10x14	12x15	12x19	12x19

## INDIRECT HEATING

Table for quick calculation of pipes and areas for indirect heating for moderate size of Steam or Water-Heating Plants.

Dimensions of Pipe	Area in Square Inches	Size of Register Required
8 inches.....	50	8 x 12
9 ".....	63	9 x 14
10 ".....	78	10 x 16
12 ".....	113	14 x 16
14 ".....	154	16 x 20
16 ".....	201	18 x 24
18 ".....	254	20 x 26
20 ".....	314	24 x 27
22 ".....	380	24 x 32
24 ".....	452	30 x 30

Quoted from Standard Authorities. Not Guaranteed

# IMPERIAL RADIATOR COMPANY LIMITED

## SYSTEM OF PROPORTIONING WATER RADIATION BASED ON LOSS OF HEAT IN B.T.U.

Single Glass		Exposed Wall				Cubical Contents one change of air per hour	
Square Feet	Radi- ation	Square Feet	Radiation 8 in. or 9 in. Brick	Radiation 12 in. or 1st Class Frame	Radiation 16 in. Brick	Cubical Contents	Radi- ation
6	3	10	2	1	1	350	3
7	3	20	4	3	2	400	4
8	4	30	6	4	3	450	4
9	4	40	9	6	5	500	5
10	5	50	11	7	6	550	5
12	6	60	13	9	7	600	6
14	7	70	15	10	8	700	6
16	8	80	17	12	9	800	7
18	9	90	19	13	10	900	8
20	10	100	21	15	12	1000	9
22	10	110	24	16	13	1200	11
24	11	120	26	18	14	1400	13
26	12	130	28	19	15	1600	15
28	13	140	30	21	16	1800	16
30	14	150	32	22	17	2000	18
32	15	160	34	24	19	2200	20
34	16	170	36	25	20	2400	22
36	17	180	38	26	21	2600	24
38	18	190	41	28	23	2800	26
40	19	200	43	29	24	3000	28
42	20	220	47	32	26	3200	29
44	21	240	51	35	29	3400	31
46	22	260	56	38	31	3600	33
48	23	280	60	41	33	3800	35
50	24	300	64	44	35	4000	37
52	25	320	68	47	38	4200	39
54	26	340	73	50	40	4400	40
56	27	360	77	53	42	4600	42
58	28	380	81	56	45	4800	44
60	29	400	85	59	48	5000	46
For double glass (such as storm windows) deduct 50%.		For poorly constructed frame houses or 8 inch brick when plas- tered on brick, take double Radi- ation required for 12 inch brick wall.				For rooms with large open mantels or loose windows etc., use double amount required for one change of air per hour.	

For windward or northern exposures add 10 to 15%.

The above is based on a difference of 70° between outside and inside tempera-  
tures for other temperatures allow 2% for each degree difference.

# IMPERIAL RADIATOR COMPANY LIMITED

## STEAM RADIATION, BASED ON LOSS OF HEAT IN B.T.U.

Single Glass.		Exposed Wall.				Cubical contents one change of air per hour.	
Square Feet.	Radiation.	Square Feet.	Radiation 8 or 9 in. brick.	Radiation 12 in. or 1st class frame.	Radiation 16 inch brick.	Cubical contents.	Radiation.
6	2	10	1	1	1	350	2
7	2	20	2	2	2	400	2
8	3	30	4	3	3	450	3
9	3	40	5	4	3	500	3
10	3	50	7	5	4	550	3
12	4	60	8	6	5	600	4
14	4	70	9	7	5	700	4
16	5	80	11	7	6	800	5
18	5	90	12	8	7	900	5
20	6	100	13	9	8	1,000	6
22	7	110	15	10	8	1,200	7
24	7	120	16	11	9	1,400	8
26	8	130	17	12	10	1,600	9
28	8	140	19	13	10	1,800	10
30	9	150	20	14	11	2,000	12
32	10	160	21	15	12	2,200	13
34	10	170	23	16	13	2,400	14
36	11	180	24	17	14	2,600	15
38	12	190	25	18	15	2,800	16
40	12	200	27	19	16	3,000	17
42	13	220	29	20	17	3,200	19
44	13	240	32	22	18	3,400	20
46	14	260	35	24	20	3,600	21
48	15	280	37	26	21	3,800	22
50	15	300	40	28	23	4,000	23
52	16	320	43	30	24	4,200	24
54	16	340	45	32	26	4,400	26
56	17	360	48	33	27	4,600	27
58	18	380	51	35	29	4,800	28
60	19	400	53	37	31	5,000	29
For double glass (such as storm windows) deduct 50 %.		For poorly-constructed frame houses or 8 inch brick when plastered on brick take double radiation required for 12 inch brick wall.				For rooms with large open mantels or loose windows, etc., use double amount required for one change of air per hour.	

For windward or northern exposures add 10 to 15%.

The above is based on a difference of 70° between outside and inside temperatures. For other temperatures allow 2% for each degree difference.

## HEATING GREENHOUSES AND CONSERVATORIES

The proposition being for a good construction of building without exceptional conditions, the following will be safe practice in the assignment of radiation to meet the exigencies of **zero** weather.

### HOT WATER

To maintain Temperature of	40 to 50 Degrees	50 to 70 Degrees
One square foot of surface to	3½ to 4 sq. feet Glass	3 to 3½ sq. feet Glass

### STEAM

To maintain Temperature of	40 to 50 Degrees	50 to 70 Degrees
One square foot of surface to	5½ to 6½ sq. feet Glass	4½ to 6 sq. feet Glass

Having found the amount of radiation required, select a boiler of large size—one or two sizes larger—not one that will just do the work. A larger body of coal, under slower combustion, holding always a large reserve power to meet sudden changes and emergencies, will be in the order of economy and a security to the best results.

A most important part of a greenhouse plant is the chimney; it should be of brick or tile of ample size and height, not less than 25 feet high. Sheet iron chimneys should not be tolerated.

## CHIMNEY FLUES

Chimney flues should be of ample size and straight from near the cellar floor to above the highest projection of the roof. It should be absolutely independent and of sufficient area for passing sufficient air for the greatest consumption of fuel to be used. Less air will not do; more than is required will do no harm as it will be within the power of the draft regulator to lessen it. A well jointed tile flue, perfectly round, is better than a brick flue of equal area. A square brick flue is preferable to a rectangular one on account of the greater friction in the latter. Rectangular flues of extreme proportions, i.e., length to width, are very objectionable as they often induce local currents, up and down, which become a distraction.

Direct Radiation		Height of Chimney Flue					
Steam in Sq. Feet	Water in Sq. Feet	20 ft.	30 ft.	40 ft.	50 ft.	60 ft.	80 ft.
250	375	7.4	7.	6.7	6.4	6.2	6.
500	750	9.6	9.2	8.8	8.2	8.	6.6
750	1,150	11.3	10.8	10.2	9.6	9.3	8.8
1,000	1,500	12.8	12.	11.4	10.8	10.5	10.
1,500	2,250	15.2	14.4	13.4	12.8	12.4	11.5
2,000	3,000	17.2	16.3	15.2	14.5	14.	13.2
3,000	4,500	20.6	18.5	18.2	17.2	16.6	15.8
4,000	6,000	23.6	22.2	20.8	19.6	19.	17.8
5,000	7,500	26.	24.6	23.	21.6	21.	19.4
6,000	9,000	28.4	26.8	25.	23.4	22.8	21.2
7,000	10,500	30.4	28.8	27.	25.5	24.4	23.
8,000	12,000	32.4	30.6	28.6	26.8	26.	24.2
9,000	13,500	34.	32.4	30.4	28.4	27.4	25.6
10,000	15,000	37.	34.	32.	30.	28.6	27

### A LESS SPECIFIC RULE FOR CHIMNEY FLUES

Herewith is a table of chimney flue sizes which is commonly used with good results. It does not take into consideration varying heights of stacks, but is said to be reliable in average conditions.

Direct Radiation*		Size of Flue	
Steam in Square Feet	Water in Square Feet	Round	Square
250	400	8	8 x 8
300	500	8	8 x 8
400	700	8	8 x 8
500	850	10	8 x 12
600	1,000	10	8 x 12
700	1,200	10	8 x 12
800	1,350	12	12 x 12
900	1,500	12	12 x 12
1,000	1,700	12	12 x 12
1,200	2,100	12	12 x 12
1,400	2,400	14	12 x 16
1,600	2,700	14	12 x 16
1,800	3,000	14	12 x 16
2,000	3,400	14	12 x 16
2,200	3,700	16	16 x 16
3,000	5,100	16	16 x 16
3,500	5,900	18	16 x 20
5,000	8,500	18	16 x 20

\*Indirect radiation should be counted as 50 per cent. more than direct, and corresponding areas of flue should be provided therefor. The amount of radiation determines the requisite size of Boiler, and therefore area of flue.

## NOTES ON CHIMNEYS

Chimneys which make a turn to go around a fire place, or which are offset from a vertical position will almost always prove defective, unless care is exercised to make the offset very smooth and the area of the chimneys larger than if flue be carried "straight up."

The chimney-top should run above the highest part of the roof at least four feet.

The chimney should be set on inside if possible. If set on outside walls the chimney breast should extend on the inside of the house in preference to extending outside. This is for the reason that the heat radiating from the chimney reduces the intensity of draft.

Short bends for offsets should be avoided.

Enlargement at base or increased cross sectional area of chimney should be avoided.

If the flue is made of brick, the outside walls should be at least 8 inches thick to insure safety. The inside joints should be well struck, each course should be well bedded and free from surface mortar at the joints. The exposed brick at the top of Chimney should be laid in cement mortar to prevent cutting out of the joints.

The boiler flue should have no other openings either above or below the boiler smoke pipe. Special care being exercised at the base of the flue to prevent any connection between it and the soot pocket of any other flue.

If a chimney contains more than one flue the dividing wall must be carried from the bottom to the top so that each flue is independent of the other throughout its entire length.

Long smoke pipes should be avoided wherever possible. When they are necessary, great care should be taken to see that joints are made tight, where the smoke pipe fits the smokehood and enters the chimney, the joints should be made tight with boiler putty or asbestos cement.

In case it is necessary to have a long smoke pipe from the heater to the chimney, great care is necessary to prevent loss of heat. Such a smoke pipe should be one or two inches larger than regular and should have an upward grade to chimney. It should have a good coating of asbestos covering, and there should be as few turns in the pipe as possible.

Smoke pipes should not extend into the flues beyond the inside surface of the lining, otherwise the end of the pipe cuts down the area of the flue.

## CAPACITIES OF WROUGHT IRON PIPE

Inside Diameter, Inches.	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	5	6
Length of pipe per square foot of external surface.....	2.9	2.3	2.0	1.6	1.32	1.09	0.95	0.84	0.68	0.57
Square feet surface per 1 lineal foot.....	0.34	0.43	0.50	0.62	0.75	0.92	1.05	1.18	1.46	1.74
Length of pipe necessary to contain 1 gallon of water....	22.3	12.8	9.4	5.7	4.02	2.6	1.95	1.51	.96	.62

## PRESSURE OF WATER FOR EACH FOOT IN HEIGHT

Feet in Height.	Pounds per Square Inch.	Feet in Height.	Pounds per Square In.	Feet in Height.	Pounds per Square In.
1	.43	15	6.49	50	21.65
2	.86	20	8.66	70	30.32
5	2.16	25	10.82	80	34.65
10	4.33	40	17.32	100	43.31

NOTE:—Above information is quoted from standard authorities. Not guaranteed.

## NUMBER OF GALLONS IN TANKS

Length or Depth in feet.	Diameter in Inches.									
	18	24	30	36	42	48	54	60	66	72
2	26	47	73	105	144	188	238	294	356	424
2 $\frac{1}{2}$	33	59	90	131	180	235	298	367	445	530
3	40	71	109	157	216	282	357	440	534	636
3 $\frac{1}{2}$	47	83	127	183	252	329	416	513	623	742
4	54	95	145	209	288	376	475	586	712	848
4 $\frac{1}{2}$	61	107	163	235	324	423	534	659	801	954
5	68	119	180	261	360	470	593	732	890	1,060
5 $\frac{1}{2}$	75	131	200	287	396	517	652	805	979	1,166
6	82	143	217	313	432	564	711	878	1,068	1,272
6 $\frac{1}{2}$	89	155	235	339	468	611	770	951	1,157	1,378
7	96	167	253	365	504	658	829	1,024	1,246	1,484
7 $\frac{1}{2}$	103	179	271	391	540	705	888	1,097	1,335	1,590
8	110	191	289	417	576	752	947	1,170	1,424	1,696
8 $\frac{1}{2}$	.....	203	307	443	612	799	1,006	1,243	1,513	1,802
10	.....	239	361	521	720	940	1,183	1,462	1,780	2,120
12	.....	287	433	625	861	1,128	1,419	1,754	2,136	2,544
14	.....	.....	.....	.....	1,008	1,316	1,655	2,046	2,492	2,968
16	.....	.....	.....	.....	1,152	1,504	1,891	2,338	2,848	3,392
18	.....	.....	.....	.....	.....	.....	2,127	2,630	3,204	3,816
20	.....	.....	.....	.....	.....	.....	2,363	2,922	3,560	4,240

NOTE:—Above information is quoted from standard authorities. Not guaranteed.

# IMPERIAL RADIATOR COMPANY LIMITED

## EXPANSION OF WROUGHT IRON PIPE

Temperature of the air when pipe is fitted	Length of pipe when fitted	Length of pipe when heated to							
		215°		265°		297°		338°	
		ft.	in.	ft.	in.	ft.	in.	ft.	in.
Zero	100 feet	100	1.72	100	2.12	100	2.31	100	2.70
32°	100 "	100	1.47	100	1.78	100	2.12	100	2.45
64°	100 "	100	1.21	100	1.61	100	1.87	100	2.19

## VELOCITY OF FLOW OF WATER IN FEET PER MINUTE, THROUGH PIPES OF VARIOUS SIZES FOR VARYING QUANTITIES OF FLOW

Gals. per min.	$\frac{3}{4}$ inch	1 inch	$1\frac{1}{4}$ inch	$1\frac{1}{2}$ inch	2 inch	$2\frac{1}{2}$ inch	3 inch	4 inch
5	218	122 $\frac{1}{2}$	78 $\frac{1}{2}$	54 $\frac{1}{2}$	30 $\frac{1}{2}$	19 $\frac{1}{2}$	13 $\frac{1}{2}$	7 $\frac{2}{3}$
10	436	245	157	109	61	38	27	15 $\frac{1}{3}$
15	653	367 $\frac{1}{2}$	235 $\frac{1}{2}$	163 $\frac{1}{2}$	91 $\frac{1}{2}$	58 $\frac{1}{2}$	40 $\frac{1}{2}$	23
20	872	490	314	218	122	78	54	30 $\frac{2}{3}$
25	1090	612 $\frac{1}{2}$	392 $\frac{1}{2}$	272 $\frac{1}{2}$	152 $\frac{1}{2}$	97 $\frac{1}{2}$	67 $\frac{1}{2}$	38 $\frac{1}{3}$
30	.....	735	451	327	183	117	81	46
35	.....	857 $\frac{1}{2}$	549 $\frac{1}{2}$	381 $\frac{1}{2}$	213 $\frac{1}{2}$	136 $\frac{1}{2}$	94 $\frac{1}{2}$	53 $\frac{2}{3}$
40	.....	980	628	436	244	156	108	61 $\frac{1}{3}$
45	.....	1102 $\frac{1}{2}$	706 $\frac{1}{2}$	490 $\frac{1}{2}$	274 $\frac{1}{2}$	175 $\frac{1}{2}$	121 $\frac{1}{2}$	69
50	.....	.....	785	545	305	195	135	76 $\frac{2}{3}$
75	.....	.....	1177 $\frac{1}{2}$	817 $\frac{1}{2}$	457 $\frac{1}{2}$	292 $\frac{1}{2}$	202 $\frac{1}{2}$	115
100	.....	.....	.....	1090	610	380	270	153 $\frac{1}{3}$
125	.....	.....	.....	.....	762 $\frac{1}{2}$	487 $\frac{1}{2}$	337 $\frac{1}{2}$	191 $\frac{2}{3}$
150	.....	.....	.....	.....	915	585	405	230
175	.....	.....	.....	.....	1067 $\frac{1}{2}$	682 $\frac{1}{2}$	472 $\frac{1}{2}$	268 $\frac{2}{3}$
200	.....	.....	.....	.....	1220	780	540	306 $\frac{2}{3}$

## DECIMAL EQUIVALENTS OF FRACTIONS

Frac- tion	Dec. Equiv.	Frac- tion	Dec. Equiv.	Frac- tion	Dec. Equiv.	Frac- tion	Dec. Equiv.
1—64	0.015625	17—64	0.265625	33—64	0.515625	49—64	0.765625
1—32	0.031250	9—32	0.281250	17—32	0.531250	25—32	0.781250
3—64	0.046875	19—64	0.296875	35—64	0.546875	51—64	0.796875
1—16	0.062500	5—16	0.312500	9—16	0.562500	13—16	0.812500
5—64	0.078125	21—64	0.328125	37—64	0.578125	53—64	0.828125
3—32	0.093750	11—32	0.343750	19—32	0.593750	27—32	0.843750
7—64	0.109375	23—64	0.359375	39—64	0.609375	55—64	0.859375
1—8	0.125000	3—8	0.375000	5—8	0.625000	7—8	0.875000
9—64	0.140625	25—64	0.390625	41—64	0.640625	57—64	0.890625
5—32	0.156250	13—32	0.406250	21—32	0.656250	29—32	0.906250
11—64	0.171875	27—64	0.421875	43—64	0.671875	59—64	0.921875
3—16	0.187500	7—16	0.437500	11—16	0.687500	15—16	0.937500
13—64	0.203125	29—64	0.453125	45—64	0.703125	61—64	0.953125
7—32	0.218750	15—32	0.468750	23—32	0.718750	31—32	0.968750
15—64	0.234375	31—64	0.484375	47—64	0.734375	63—64	0.984375
1—4	0.250000	1—2	0.500000	3—4	0.750000	1—	1.000000

## EQUALIZATION OF PIPE AREAS

* Diam. Pipes Inches	Number of Smaller Pipes Equivalent to one Larger Pipe											
	$\frac{3}{4}$ "	1"	1½"	2"	3"	4"	5"	6"	7"	8"	9"	10"
½	2.27	4.88	15.8	31.7	96.9	205.	377.	620.	918.			
$\frac{3}{4}$	1.	2.05	6.9	14.	42.5	90.4	166.	273.	405.	569.	779.	
1		1.	3.5	6.8	20.9	44.1	81.1	133.	198.	278.	380.	536.
1½			1.	1.3	6.1	13.	23.8	39.2	58.1	81.7	112.	157.
2				1.	3.1	6.5	11.9	19.6	29.	40.8	55.8	78.5
2½					1.8	3.87	7.1	11.7	17.4	24.4	33.4	47.
3					1.	2.12	3.9	6.4	9.5	13.3	20.9	23.7
4						1.	1.8	3.	4.5	6.3	8.6	12.1
5							1.	1.6	2.4	3.4	4.7	6.6
6								1.	1.5	2.1	2.8	4.
7									1.	1.4	1.9	2.7
8										1.	1.3	1.9

\*Normal diameters Standard Steam and gas pipe.

### EXAMPLE

To find number of 2" Pipes which will deliver as much fluid as one 5" Pipe; In Column headed 5, and opposite 2, read 11.9 which is equivalent number of 2" pipes.

**Equation of Pipes.**—To reduce pipes of different sizes to their equivalent in 1 inch, following factors are sufficiently accurate for Ordinary purposes.

1¼	1½	2	2½	3	3½	4	4½	5	6	7	8
x	x	x	x	x	x	x	x	x	x	x	x
126	144	181	219	266	304	342	380	423	503	580	655

## TO FIND THE CAPACITY OF A TANK IN GALLONS

**FIRST STEP.** (All measurements to be in inches):

For Rectangular tanks multiply the length by the width, by the depth.

For Cylindrical Tanks, Multiply the length by the square of the diameter, by .7854.

For Elliptical Section Tanks, Multiply the length by the short diameter, by the long diameter, by .0339.

**SECOND STEP.**

Divide the result by 231 which is the number of cubic inches in one U.S. gallon, or by 277¼ the number of cubic inches in one Imperial gallon. The answer is the capacity of the tank in U.S. or Imperial Gallons as desired.

PROPERTIES OF SATURATED STEAM

Vacuum— Inches of Mercury	Absolute Pressure Lbs. per Sq. Inch	Temperature Fahrenheit	Total Heat above 32° F.		Latent Heat, Heat Units per lb.
			In the Water Heat Units per lb.	In the Steam Heat Units per lb.	
23.81	3.0	141.52	109.4	1121.6	1012.3
21.78	4.0	153.01	120.9	1126.5	1005.7
19.74	5.0	162.28	130.1	1130.5	1000.3
17.70	6.0	170.06	137.9	1133.7	995.8
15.67	7.0	176.85	144.7	1136.5	991.8
13.63	8.0	182.86	150.8	1139.0	988.2
11.60	9.0	188.27	156.2	1141.1	985.0
9.56	10.0	193.22	161.1	1143.1	982.0
7.52	11.0	197.95	165.7	1144.9	979.2
5.49	12.0	201.96	169.9	1146.5	976.6
3.45	13.0	205.87	173.8	1148.0	974.2
1.42	14.0	209.55	177.5	1149.4	971.9
Lbs. Gauge					
0.0	14.7	212.0	180.0	1150.4	970.4
0.3	15.0	213.0	181.0	1150.7	969.7
1.3	16.0	216.3	184.4	1152.0	967.6
2.3	17.0	219.4	187.5	1153.1	965.6
3.3	18.0	222.4	190.5	1154.2	963.7
4.3	19.0	225.2	193.4	1155.2	961.8
5.3	20.0	228.0	196.1	1156.2	960.0
10.3	25.0	240.1	208.4	1160.4	952.0
15.3	30.0	250.3	218.8	1163.9	945.1
20.3	35.0	259.3	227.9	1166.8	938.9
25.3	40.0	267.3	236.1	1169.4	933.3
30.3	45.0	274.5	243.4	1171.6	928.2
40.3	55.0	287.1	256.3	1175.4	919.0
50.3	65.0	298.0	267.5	1178.5	911.0
60.3	75.0	307.6	277.4	1181.1	903.7
70.3	85.0	316.3	286.3	1183.4	897.1
80.3	95.0	324.1	294.5	1185.4	890.9
91.3	106.0	332.0	302.7	1187.4	884.7
101.3	116.0	338.7	309.6	1189.0	879.3
125.3	140.0	353.1	324.6	1192.2	867.7
151.3	166.0	366.5	338.7	1195.1	856.4
175.3	190.0	377.6	350.4	1197.3	846.9
200.3	215.0	388.0	361.4	1199.2	837.9
225.3	240.0	397.4	371.4	1200.9	829.5
255.3	270.0	407.9	382.5	1202.6	820.1

# HEAT UNITS AND WEIGHT OF WATER

Heat units in water, between 32 and 212 degrees Fahrenheit and weight of water per cubic foot.

Tem. Deg. Fahr.	Heat Units	Weight lbs. per cub. ft.	Tem. Deg. Fahr.	Heat Units	Weight, lbs. per cub. ft.	Tem. Deg. Fahr.	Heat Units	Weight lbs. per cub. ft.
32	0.	62.42	123	91.16	61.68	168	136.44	60.81
35	3.	62.42	124	92.17	61.67	169	137.45	60.79
40	8.	62.42	125	93.17	61.65	170	138.45	60.77
45	13.	62.42	126	94.17	61.63	171	139.46	60.75
50	18.	62.41	127	95.18	61.61	172	140.47	60.73
52	20.	62.40	128	96.18	61.60	173	141.48	60.70
54	22.01	62.40	129	97.19	61.58	174	142.49	60.68
56	24.01	62.39	130	98.19	61.56	175	143.50	60.66
58	26.01	62.38	131	99.20	61.54	176	144.51	60.64
60	28.01	62.37	132	100.20	61.52	177	145.51	60.62
62	30.01	62.36	133	101.21	61.51	178	146.52	60.59
64	32.01	62.35	134	102.21	61.49	179	147.53	60.57
66	34.02	62.34	135	103.22	61.47	180	148.54	60.55
68	36.02	62.33	136	104.22	61.45	181	149.55	60.53
70	38.02	62.31	137	105.23	61.43	182	150.56	60.50
72	40.02	62.30	138	106.23	61.41	183	151.57	60.48
74	42.03	62.28	139	107.24	61.39	184	152.58	60.46
76	44.03	62.27	140	108.25	61.37	185	153.59	60.44
78	46.03	62.25	141	109.25	61.36	186	154.60	60.41
80	48.04	62.23	142	110.26	61.34	187	155.61	60.39
82	50.04	62.21	143	111.26	61.32	188	156.62	60.37
84	52.04	62.19	144	112.27	61.30	189	157.63	60.34
86	54.05	62.17	145	113.28	61.28	190	158.64	60.32
88	56.05	62.15	146	114.28	61.26	191	159.65	60.29
90	58.06	62.13	147	115.29	61.24	192	160.67	60.27
92	60.06	62.11	148	116.29	61.22	193	161.68	60.25
94	62.06	62.09	149	117.30	61.20	194	162.69	60.22
96	64.07	62.07	150	118.31	61.18	195	163.70	60.20
98	66.07	62.05	151	119.31	61.16	196	164.71	60.17
100	68.08	62.02	152	120.32	61.14	197	165.72	60.15
102	70.09	62.00	153	121.33	61.12	198	166.73	60.12
104	72.09	61.99	154	122.33	61.10	199	167.74	60.10
106	74.10	61.95	155	123.34	61.08	200	168.75	60.07
108	76.10	61.92	156	124.35	61.06	201	169.77	60.05
110	78.11	61.89	157	125.35	61.04	202	170.78	60.02
112	80.12	61.86	158	126.36	61.02	203	171.79	60.00
114	82.13	61.83	159	127.37	61.00	204	172.80	59.97
115	83.13	61.82	160	128.37	60.98	205	173.81	59.95
116	84.13	61.80	161	129.38	60.96	206	174.83	59.92
117	85.14	61.78	162	130.39	60.94	207	175.84	59.89
118	86.14	61.77	163	131.40	60.92	208	176.85	59.87
119	87.15	61.75	164	132.41	60.90	209	177.86	59.84
120	88.15	61.74	165	133.41	60.87	210	178.87	59.82
121	89.15	61.72	166	134.42	60.85	211	179.89	59.79
122	90.16	61.70	167	135.43	60.83	212	180.90	59.76

NOTE:—Above information is quoted from standard authorities.

# AREAS OF CIRCLES

Size	Area	Size	Area	Size	Area	Size	Area
$\frac{1}{8}$	0.0123	10	78.54	30	706.86	65	3318.3
$\frac{1}{4}$	0.0491	$\frac{1}{2}$	86.59	31	754.76	66	3421.2
$\frac{3}{8}$	0.1104	11	95.03	32	804.24	67	3525.6
$\frac{1}{2}$	0.1963	$\frac{1}{2}$	103.86	33	855.30	68	3631.6
$\frac{5}{8}$	0.3067	12	113.09	34	907.92	69	3739.2
$\frac{3}{4}$	0.4417	$\frac{1}{2}$	122.71	35	962.11	70	3848.0
$\frac{7}{8}$	0.6013	13	132.73	36	1017.8	71	3959.2
1	0.7854	$\frac{1}{2}$	143.13	37	1075.2	72	4071.5
$\frac{1}{8}$	0.9940	14	153.93	38	1134.1	73	4185.3
$\frac{1}{4}$	1.227	$\frac{1}{2}$	165.13	39	1194.5	74	4300.8
$\frac{3}{8}$	1.484	15	176.71	40	1256.6	75	4417.8
$\frac{1}{2}$	1.767	$\frac{1}{2}$	188.69	41	1320.2	76	4536.4
$\frac{5}{8}$	2.073	16	201.06	42	1385.4	77	4656.0
$\frac{3}{4}$	2.405	$\frac{1}{2}$	213.82	43	1452.2	78	4778.3
$\frac{7}{8}$	2.761	17	226.98	44	1520.5	79	4901.6
2	3.141	$\frac{1}{2}$	240.52	45	1590.4	80	5026.5
$\frac{1}{4}$	3.976	18	254.46	46	1661.9	81	5153.0
$\frac{1}{2}$	4.908	$\frac{1}{2}$	268.80	47	1734.9	82	5281.0
$\frac{3}{4}$	5.939	19	283.52	48	1809.5	83	5410.6
3	7.068	$\frac{1}{2}$	298.64	49	1885.7	84	5541.7
$\frac{1}{4}$	8.295	20	314.16	50	1963.5	85	5674.5
$\frac{1}{2}$	9.621	$\frac{1}{2}$	330.06	51	2042.8	86	5808.8
$\frac{3}{4}$	11.044	21	346.36	52	2123.7	87	5944.6
4	12.566	$\frac{1}{2}$	363.05	53	2206.1	88	6082.1
$\frac{1}{2}$	15.904	22	380.13	54	2290.2	89	6221.1
5	19.635	$\frac{1}{2}$	397.60	55	2375.8	90	6361.7
$\frac{1}{2}$	23.758	23	415.47	56	2463.0	91	6503.8
6	28.274	$\frac{1}{2}$	433.73	57	2551.7	92	6647.6
$\frac{1}{2}$	33.183	24	452.39	58	2642.0	93	6792.9
7	38.484	$\frac{1}{2}$	471.43	59	2733.9	94	6939.7
$\frac{1}{2}$	44.178	25	490.87	60	2827.4	95	7088.2
8	50.265	26	530.93	61	2922.4	96	7238.2
$\frac{1}{2}$	56.745	27	572.55	62	3019.0	97	7389.8
9	63.617	28	615.75	63	3117.2	98	7542.9
$\frac{1}{2}$	70.882	29	660.52	64	3216.9	99	7697.7

To find the diameter of a circle when circumference is given, multiply the given circumference by .31831.

# CIRCUMFERENCE OF CIRCLES

Diam.	Circumference	Diam.	Circumference	Diam.	Circumference	Diam.	Circumference
	.3927	10	31.416	30	94.248	65	204.204
$\frac{1}{4}$	.7854	$\frac{1}{2}$	32.987	31	97.389	66	207.345
$\frac{3}{8}$	1.1781	11	34.558	32	100.531	67	210.487
$\frac{1}{2}$	1.5708	$\frac{1}{2}$	36.128	33	103.673	68	213.628
$\frac{5}{8}$	1.9635	12	37.699	34	106.814	69	216.770
$\frac{3}{4}$	2.3562	$\frac{1}{2}$	39.270	35	109.956	70	219.911
$\frac{7}{8}$	2.7489	13	40.841	36	113.097	71	223.053
1	3.1416	$\frac{1}{2}$	42.412	37	116.239	72	226.195
	3.5343	14	43.982	38	119.381	73	229.336
$\frac{1}{4}$	3.9270	$\frac{1}{2}$	45.553	39	122.522	74	232.478
$\frac{3}{8}$	4.3197	15	47.124	40	125.664	75	235.619
$\frac{1}{2}$	4.7124	$\frac{1}{2}$	48.695	41	128.805	76	238.761
$\frac{5}{8}$	5.1051	16	50.265	42	131.947	77	241.903
$\frac{3}{4}$	5.4978	$\frac{1}{2}$	51.836	43	135.088	78	245.044
$\frac{7}{8}$	5.8905	17	53.407	44	138.230	79	248.186
2	6.2832	$\frac{1}{2}$	54.978	45	141.372	80	251.327
$\frac{1}{4}$	7.0686	18	56.549	46	144.513	81	254.469
$\frac{1}{2}$	7.8540	$\frac{1}{2}$	58.119	47	147.655	82	257.611
$\frac{3}{4}$	8.6394	19	59.690	48	150.796	83	260.752
3	9.4248	$\frac{1}{2}$	61.261	49	153.938	84	263.894
$\frac{1}{4}$	10.210	20	62.832	50	157.080	85	267.035
$\frac{1}{2}$	10.996	$\frac{1}{2}$	64.403	51	160.221	86	270.177
$\frac{3}{4}$	11.781	21	65.973	52	163.363	87	273.319
4	12.566	$\frac{1}{2}$	67.544	53	166.504	88	276.460
$\frac{1}{2}$	14.137	22	69.115	54	169.646	89	279.602
5	15.708	$\frac{1}{2}$	70.686	55	172.788	90	282.743
$\frac{1}{2}$	17.279	23	72.257	56	175.929	91	285.885
6	18.850	$\frac{1}{2}$	73.827	57	179.071	92	289.027
$\frac{1}{2}$	20.420	24	75.398	58	182.212	93	292.168
7	21.991	$\frac{1}{2}$	76.969	59	185.354	94	295.310
$\frac{1}{2}$	23.562	25	78.540	60	188.496	95	298.451
8	25.133	26	81.681	61	191.637	96	301.593
$\frac{1}{2}$	26.704	27	84.823	62	194.779	97	304.734
9	28.274	28	87.965	63	197.920	98	306.876
$\frac{1}{2}$	29.845	29	91.106	64	201.062	99	311.018

To find the circumference of a circle when diameter is given multiply the given diameter by 3.1416.

## TO DETERMINE BOILER CAPACITY REQUIRED TO HEAT SWIMMING POOL

$L \times W \times D$  equals cubic feet; where  $L$  equals the length of the pool in feet,  $W$  equals the width and  $D$  equals the average depth of the water.

From table page 124, determine the number of pounds per cubic foot at initial temperature of the water. This quantity multiplied by the number of cubic feet gives the number of pounds of water to be heated.

Pounds of water multiplied by the difference between initial and final temperature equals B. T. U. to be supplied, and dividing by the number of hours allowed for heating gives number of B. T. U. required to be supplied per hour.

Divide B. T. U. required per hour by 150 to determine rating of water boiler, or by 240 to determine rating of steam boiler.

**NOTE:**—If quantity of water is given in gallons multiply by  $8\frac{1}{3}$ , (approximately  $8\frac{1}{3}$  pounds to the gallon) to reduce it to pounds.

## LOSS OF HEAT FROM ACCUMULATION OF SOOT

Showing the loss in conductivity of boiler plate due to difference in thickness of soot deposit.

Thickness of Soot	Loss Per Cent.
Clean.....	0.0
$1/32''$ .....	9.5
$1/16''$ .....	26.2
$1/8''$ .....	45.2
$3/16''$ .....	69.0

\*Proceedings, Institute of Marine Engineers, January 6, 1908.

## RELATIVE VALUE OF HEATING SURFACES

Horizontal Surfaces above the flame, equal.....	1.00
Vertical Surfaces above the flame, equal.....	.50
Horizontal Surfaces beneath the flame.....	.10
Tubes and Flues equal $1\frac{1}{4}$ times their diameter.	
Convex Surfaces above the flame equal $1\frac{1}{6}$ diameter.	

## DATA ON FUELS

### **Comparative Costs of Heating by Electricity, Fuel Oil, Hard and Soft Coal**

The examples shown below will give anyone the necessary information to determine the comparative cost of heating a building by electricity, fuel oil, hard and soft coal, by using the figures or costs of the fuels mentioned in his own locality.

#### **Heating by Electricity—**

The Heating Value of one kilowatt-hour is approximately 3,400 thermal units, therefore at 2 cents per K.W.H., one cent will purchase 1,700 thermal units.

#### **Heating by Hard Coal—**

The heating value of a pound of coal is about 8,000 thermal units. At \$15.00 per ton, one cent will purchase about 10,666 thermal units.

#### **Heating by Fuel Oil—**

The available heating value of one Imperial gallon of fuel oil for heating purposes is approximately 140,000 thermal units. At 10.8 cents per Imperial gallon, one cent will purchase about 12,960 thermal units.

#### **Heating by Soft Coal—**

The available heating value of a pound of soft coal is about 6,000 thermal units. With fair grades of soft coal priced at \$9.00 per ton, one cent will purchase about 13,330 thermal units.

#### **Comparison—**

With electricity, coal, and oil, at the prices shown above, it will be seen that heating by electricity costs about six and two-thirds times as much as by hard coal, about 8 times as much as by soft coal, and about seven and one-half times as much as by fuel oil. At present, oil and hard coal costs are much the same, but oil is a little more costly than soft coal.

# DATA ON FUELS—Continued

## Average Weight of Coal.

1 cu. ft. of Hard Coal weighs about . . . . . 50 pounds  
 1 cu. ft. of Soft Coal weighs about . . . . . 40 pounds  
 1 cu. ft. of Coke, weighs about . . . . . 28 pounds

## Names and Sizes of Anthracite or "Hard" Coal

Names of Sizes	Mesh it will Pass Through		Mesh it Will not Pass Through	
Grate . . . . .	4" Sqr.	4 1/2" Rd.	2 3/4" Sqr.	3 1/8" Rd.
Egg . . . . .	2 3/4" "	3 1/8" "	2" "	2 1/4" "
Stove . . . . .	2" "	2 1/4" "	1 3/8" "	1 9/16" "
Nut . . . . .	1 3/8" "	1 5/16" "	3/4" "	7/8" "
Pea . . . . .	3/4" "	7/8" "	1/2" "	9/16" "
Buckwheat . .	1/2" "	9/16" "	1/4" "	5/16" "
Rice . . . . .	1/4" "	5/16" "	1/8" "	3/16" "
Barley . . . . .	1/8" "	3/16" "	.....	1/16" "

## Names and Sizes of Bituminous or "Soft" Coal

For "Domestic" Soft Coals there are no uniform names and sizes; but they are usually marketed under these classes.

"Screenings" . . . . . Usually smallest sizes.  
 "Duff" . . . . . Goes through 1/8 in. screen.  
 "No. 3 Nut" . . . . . Goes through 1 1/4 in. screen,  
 over 3/4 in. screen.  
 "No. 2 Nut" . . . . . Goes through 2 in. screen, over  
 1 1/4 in. screen.  
 "No. 1 Domestic Nut" . . . . . Goes through 3 in. screen, over  
 1 1/2 or 2 in. screen.  
 "No. 4 Washed" . . . . . Goes through 3/4 in. screen, over  
 1/4 in. screen.  
 "No. 3 Washed Chestnut" . . . . . Goes through 1 1/4 in. screen,  
 over 3/4 in. screen.  
 "No. 2 Washed Stove" . . . . . Goes through 2 in. screen, over  
 1 1/4 in. screen.  
 "No. 1 Washed Egg" . . . . . Goes through 3 in. screen, over  
 2 in. screen.  
 "No. 3 Roller Screened Nut" . . . . . Goes through 1 1/2 in. screen, over  
 1 in. screen.  
 "No. 2 Roller Screened Nut" . . . . . Goes through 2 in. screen, over  
 1 1/2 in. screen.

## DATA ON FUELS—*Continued*

"No. 1 Roller Screened Nut". Goes through  $3\frac{1}{2}$  in. screen, over 2 in. screen.

"Egg"..... Goes through 6 in. screen, over 3 in. screen.

"Lump" or "Block"..... Goes through 6 in. screen, or over.

"Run of Mine"..... In fine and large lumps.

Pocahontas Smokeless..... Generally sized as "Nut," "Egg" "Lump" and "Mine Run".

Cannell Coal..... For Fire Places—"Hand Picked Lump"; for Stoves—"Egg".

Domestic By-product Coke.. "Egg", 3 in.- $2\frac{1}{2}$  in.; "Large Stove"  $2\frac{1}{2}$  in.-2 in.; "Small Stove" 2 in.- $1\frac{1}{2}$  in.; "Nut"  $1\frac{1}{2}$  in.- $\frac{3}{4}$  in.; "Pea"  $\frac{3}{4}$  in.- $\frac{1}{2}$  in.

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## Evaporating Power of Fuels

Under Favorable Conditions:—

1 pound of Oil will evaporate from 14 to 16 pounds of water from and at  $212^{\circ}$ .

1 pound of Coal will evaporate from 7 to 10 pounds of water from and at  $212^{\circ}$ .

1 pound of Natural Gas (21.9 cu. ft.) will evaporate from 18 to 20 pounds of water from and at  $212^{\circ}$ .

## ERECTING AND PLACING BOILERS

**Be careful** to have base level before setting the boiler on it.

**Make sure** that there is sufficient head room for the smoke pipe, and for a proper grade for the mains before setting the boiler. If it is impossible to obtain sufficient head room the boiler should be set in a pit. See page 139 for further particulars.

**The boiler** should be placed as close to the chimney as possible.

**The boiler** should be covered with asbestos or other non-inflammable material which conserves the heat and prevents cold air being drawn into the boiler through the fire joints.

**In calculating** the heating capacity of boiler required when using a coil or any kind of heater in the boiler for the purpose of heating water in the range boiler, an allowance should be made of 3 square feet of heating capacity for every gallon of water to be heated.

**Instructions** should always be given the parties for whom the boiler is installed, setting forth the proper method of operating. Particular **attention** should be given to the fact that the grates will be burned out if the ashes are not removed regularly.

**It is advisable** that a hot water thermometer be provided for every plant, and necessary instructions given as to the proper temperature at which the water should be maintained, according to weather, etc.

### **\*To Clean a Water Gauge Glass on a Steam Boiler**

Put in a cup of hot water a tablespoonful of Raw Muriatic or other acid, then close the top and bottom water gauges, open top water gauge and blow water out of glass through pet-cock at bottom, again close top valve and place cup of hot water so bottom pet-cock is submerged in the solution, a vacuum being caused the acid and water will fill the gauge glass. By keeping the pet-cock in the water and alternately opening and closing the top water gauge the glass will be thoroughly cleansed. Then close pet-cock and open both water gauge cocks. The water line of the boiler will again show. It is necessary to have a pressure of one or two pounds on the boiler before proceeding as above.

## BLOWING OFF A STEAM BOILER

A steam boiler should be blown off within one week after it is in operation, to remove the unavoidable accumulation of oil, grease, etc., which have a tendency to cause foaming, preventing the generation of steam and causing an unsteady water line. This can only be done when the boiler is under pressure. If one blowing off does not result in a steady water line and clean gauge, the operation must be repeated a second, or if necessary, a third and fourth time.

1. Close all radiator valves, or, if the mains are valved, close both Flow and Return valves tightly. Remove damper regulator and plug the opening.
2. Remove the safety valve and connect a blow-off pipe to the opening, extending to suitable drain or out of the basement window. The size of this pipe should be the same as the safety valve, and should be provided with full size cock.
3. With a wood fire and boiler filled to top of water glass, raise steam pressure to fifteen pounds. Open cock in safety valve pipe, allowing pressure to cause water to be siphoned through this pipe, thus carrying away the surface grease and oil, and maintain the steam pressure at fifteen pounds. Supply cold water at the bottom of the boiler to maintain water line at the top of the gauge glass. After this operation has been continued for two hours, close the upper blow-off cock and water supply, and open blow-off at bottom of boiler, being careful that sufficient fire is carried to maintain a pressure until the last gallon of water is blown out.
4. Draw the remaining fire and open all fire and flue doors wide.
5. Allow the boiler to become cool, close blow-off, remove piping from safety valve opening, replace safety valve and damper regulator, and fill boiler slowly to normal water line.
6. Open radiator, flow and return valves.
7. Re-build fire.

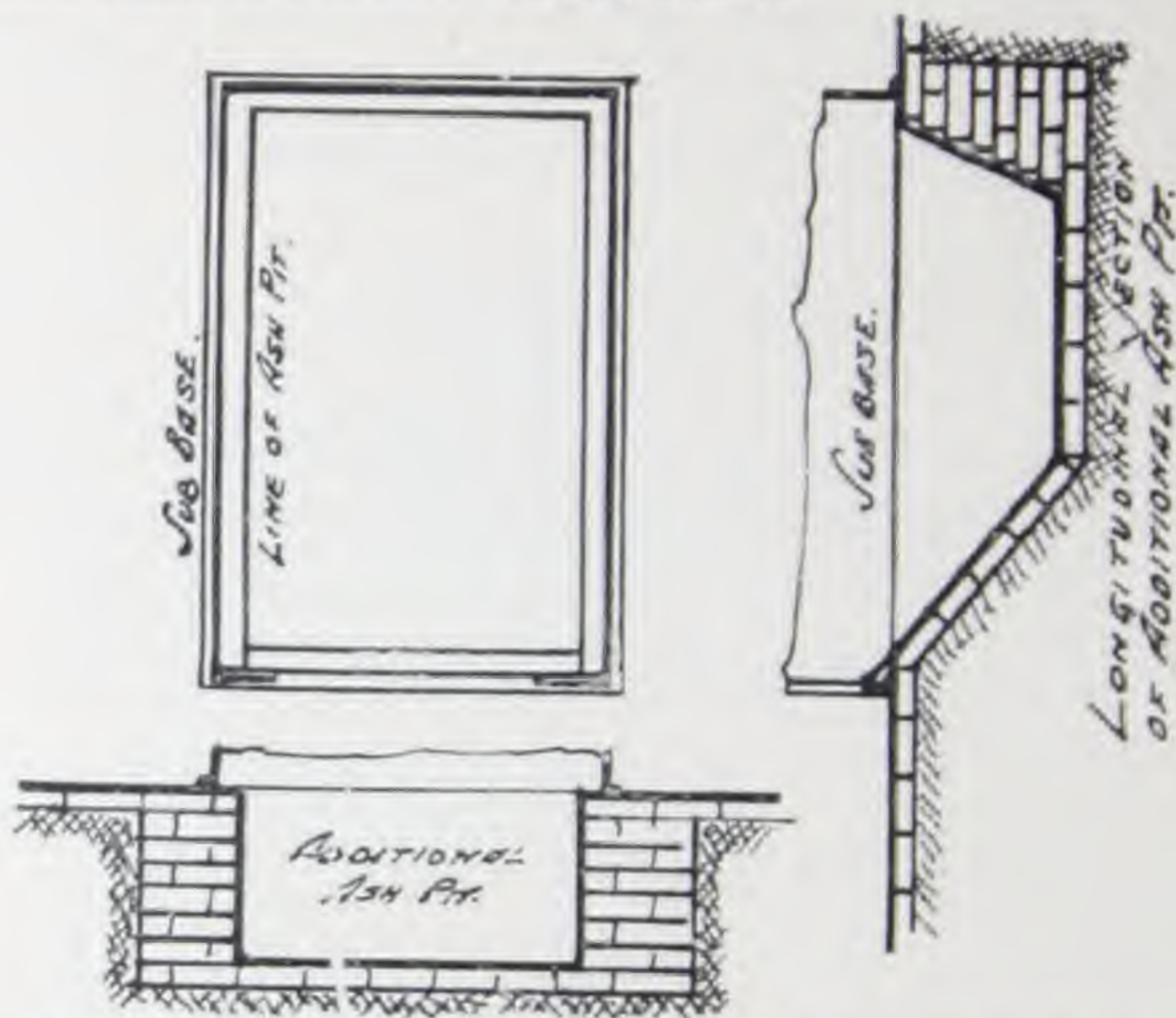
In boilers where a large amount of oil and grease is present, it may be desirable to add a small quantity of soda ash, which should be boiled in boiler for half an hour before the blowing-off operation is started.

Five pounds of Soda Ash for small sizes up to thirty pounds for the largest boilers, will usually be sufficient.

In cases where there is no water supply pressure, the surface blowing-off cannot be a continuous operation. Therefore, the bottom blow-off should be repeated several times.

## BOILER FOUNDATIONS

In setting heating boilers, either round or square, the contractor should first note that the foundation is level and firm. A space left underneath the base allows the air to draw in ash-pit, the same as when the draft door is open. This air leakage accounts for the large consumption of fuel often found in residence heating boilers.



As about 95 per cent. of all burned-out grate bars are directly traceable to the accumulation of ashes under grates, it will be found of much value, when the condition will permit, to deepen the ash-pit by either making a raised foundation of brick under edge of boiler, or by excavating and cementing the sides and ends as shown by the illustration above.

## INSTRUCTIONS FOR COVERING BOILERS, HEATERS, ETC., WITH ASBESTOS CEMENT

The cement is usually applied in three coats  $\frac{1}{2}$ " to  $\frac{3}{4}$ " thick regulated according to the total thickness required. The material is mixed with water in an ordinary box to a consistency of mortar and should be allowed to stand several hours before using. Use an ordinary plasterer's trowel for applying.

Apply first coat (about  $\frac{1}{2}$ " thick) to the boiler while it is warm, leaving the surface rough in order that the second coat may properly adhere. Stop back about 1 inch from all manholes, doors and other openings, and when putting on last coat, finish up the edges around all openings to a nice level. When the first coat is thoroughly dry, the second coat may be applied in the same manner as the first, leaving it rough for the reception of the next coat. For the third coat mix Portland Cement with the Asbestos Cement, proportions half and half, and after applying, smooth it down, a hard finish will result.

NOTE:—The boiler should be kept quite hot during the application, as each coat should be thoroughly dry before proceeding with the next.

## CLEANING STEAM BOILERS IN SPRING

At the close of the heating season fill the steam boiler with water to the safety valve and let it thus stand through the summer. Disconnect smokepipe, thoroughly clean it, and store away in a dry place. Leave boiler doors open. Clean all the inner surfaces, and at the opening of the next season withdraw the water and refill with fresh water to the water line, starting the boiler as before. See that the cement between the sections is in place, if it has dropped out, have the joints tightly re-cemented.

## RULES RELATIVE TO THE CIRCLE

- TO FIND CIRCUMFERENCE—Multiply diameter by . . . . . 3.1416  
 Or divide diameter by . . . . . 0.3183
- TO FIND DIAMETER—Multiply circumference by . . . . . 0.3183  
 Or divide circumference by . . . . . 3.1416
- TO FIND RADIUS—Multiply circumference by . . . . . 0.15915  
 Or divide circumference by . . . . . 6.28318
- TO FIND SIDE OF AN INSCRIBED SQUARE:—  
 Multiply diameter by . . . . . 0.7071  
 Or multiply circumference by . . . . . 0.2251  
 Or divide circumference by . . . . . 4.4428
- TO FIND SIDE OF A SQUARE OF EQUAL AREA:—  
 Multiply diameter by . . . . . 0.8862  
 Or divide diameter by . . . . . 1.1284  
 Or multiply circumference by . . . . . 0.2821  
 Or divide circumference by . . . . . 3.545
- SQUARE:—A side multiplied by 1.4142 equals diameter of its circumscribing circle.  
 A side multiplied by 4.443 equals circumference of its circumscribing circle.  
 A side multiplied by 1.1284 equals diameter of a circle of equal area.  
 A side multiplied by 3.545 equals circumference of an equal circle.
- TO FIND THE AREA OF A CIRCLE:—See table page 138.  
 Multiply circumference by one-quarter of the diameter.  
 Or multiply the square of diameter by 0.7854.  
 Or multiply the square of circumference by 0.07958.  
 Or multiply the square of one-half diameter by 3.1416.
- TO FIND THE AREA OF AN ELLIPSE:—  
 Multiply the product of its axis by .7854.  
 Or multiply the products of its semi-axis by 3.14159.
- TO FIND THE SURFACE OF A SPHERE OR GLOBE:—  
 Multiply the diameter by the circumference.  
 Or multiply the square of diameter by 3.1416.  
 Or multiply 4 times the square of radius by 3.1416.
- TO FIND THE AREA OF TRIANGLE:—  
 Multiply base by one-half altitude.
- TO FIND THE PERIMETER OF AN ELLIPSE:—  
 Multiply the greater axis by 1.82 and the smaller axis by 1.315 and add the results.

## USEFUL DATA

**Water Boils** in open vessel, atmospheric pressure sea level at  $212^{\circ}$ .

**Water Boils** at lesser temperature than  $212^{\circ}$  when atmospheric pressure is less, as in case of higher altitudes. The temperature of the resultant vapor or steam will be proportionately less.

**Water Boils** in vacuum at  $93^{\circ}$ . Hence resultant vapor is  $98^{\circ}$ .

**Water Expands** about one-tenth in bulk by freezing.

**Water Expands** in heating from  $39$  to  $212^{\circ}$  one twenty-third or about 4 per cent. in bulk.

**Water** has greatest density or occupies least space at  $39^{\circ}$  Fah.

**A Cubic Inch of Water** evaporated at atmospheric pressure 14.7 lbs. makes (approximately) one cubic foot of steam.

**A Column of Water** 27.67 inches high has a pressure of one pound to the inch, approximately it is estimated that every foot of water equals one-half pound pressure.

**Multiplying the Height of a Column of Water** by .434 gives pressure in pounds.

**A Cubic Foot of Water** weighs 62.321 pounds and equals 7.48 U.S. gallons.

**Water in Circulation** is the best known absorbent of heat, and gives out more heat in cooling through a given range of temperature than any known substance.

**A Hundred Square Feet** of radiation contains approximately 15 gallons of water.

**Bodies which Absorb Heat Best, Radiate it Best.**

**Heat Unit**, known as **British Thermal Unit**, or B.T.U., raises temperature of one pound of water one degree Fah.

**Heat Unit** is  $1^{\circ}$  or  $1/180^{\circ}$  of the distance between freezing and boiling point of water.

**Heat Unit.** 966 heat units will evaporate one pound of water at  $212^{\circ}$  into steam.

**Heat Units** emitted per hour by a square foot of cast iron radiation, under favorable conditions, will be two for each degree of difference between the temperature of the radiator and surrounding air.

**Heat Unit.** A pound of anthracite coal contains 14,500 heat units.

**The Commercial Ratings of Low Pressure Steam Heaters** are based upon a pressure of 2 pounds of steam ( $219^{\circ}$ ) and of water heaters an average temperature of the water of circulation of  $170^{\circ}$  in their maximum service. Systems of heating that provide for higher pressure and temperatures, larger size heaters must be used.

**Horse Power** is a very elastic phrase as applied to boilers, and quite empirical. It may serve as a descriptive or comparative term but not as expressing any comprehensible power.

**A Horse Power.** That Power required to raise 33,000 pounds one foot per minute.

**A Horse Power.** The equivalent of 33,000 heat units per hour.

**A Horse Power.** That necessary to evaporate 30 pounds of water per hour from  $100^{\circ}$  70 pounds pressure, feed water  $100^{\circ}$ .

**A Horse Power.** Fifteen square feet of heating surface in a standard tubular boiler is estimated as equal to one horse power.

**A Horse Power** is estimated equal 75 to 100 square feet direct radiation.

**Area of a Circle.** Multiply square of its diameter by .7854.

## USEFUL DATA—Continued

1 Pound of Oil, equals 19500 B.T.U.'s.

Doubling the Diameter of a Pipe increases its capacity four times.

Wrought Iron Steam and Gas Pipe is reckoned by its internal diameter.

Boiler Tubes are reckoned by their external diameter.

Area of Chimney should be one-seventh to one-tenth area of grate.

One Square Foot of Grate Area will average in consumption in low pressure steam boilers 3 to 5 pounds anthracite coal per hour.

One Square Foot of Grate Area will average in consumption in high pressure steam boilers 12 pounds anthracite coal per hour.

Average Consumption of fuel is  $7\frac{1}{2}$  pounds coal or 15 pounds dry pine wood to evaporate one cubic foot of water.

One Bushel anthracite coal weighs 86 pounds, at 14,500 B.T.U. per pound equals 1,247,000 B.T.U.

One Bushel bituminous coal weighs 76 pounds, at 11,600 B.T.U. per pound equals 881,600 B.T.U.

One Bushel Connellsville coke weighs 40 pounds, at 11,600 B.T.U. per pound equals 464,000 B.T.U.

One Bushel charcoal weighs 30 pounds, at 13,920 B.T.U. per pound equals 417,600 B.T.U.

A Ton of Hard Coal occupies a space equal to 37 cubic feet.

A Ton of Soft Coal occupies a space equal to 40 cubic feet.

A Ton and a Half Hard Coal to a hundred square feet water radiation, or to fifty square feet steam radiation, is the estimated fuel consumption for the winter's firing.

A Ton of Hard Coal is considered equal to a ton and a half of soft coal.

One pound of Gold or Color Bronze requires one quart of liquid and will cover from 250 to 300 feet of radiation.

One pound of Aluminum Bronze requires three quarts of liquid and will cover from 500 to 600 square feet of radiation.

B.T.U. divided by 33,000 equals H.P.

B.T.U. divided by 250 equals steam radiation, square feet.

B.T.U. divided by 150 equals water radiation, square feet.

B.T.U. divided by 50 equals cubic feet of air warmed 1 degree per hour.

One Kilowatt Hour equals 3412 B.T.U.'s

One Watt Hour equals 3.412 B.T.U.'s

One B.T.U. equals 0.293 Watt Hour.

Steam is the vapor rising from water at or above its boiling point. 212 degrees sea level.

Steam Proper is transparent and colorless, dry and wholly invisible except when partly condensed, when it is moist.

Low Pressure Steam is steam pressure not exceeding 15 pounds per square inch.

Super Heated Steam is steam heated to a temperature higher than is due to its pressure after leaving the fluid from which it is formed.

Saturated Steam is steam which in contact with the fluid from which it is formed carries with it a proportion of its moisture.

## USEFUL INFORMATION

### BOILING POINTS OF VARIOUS FLUIDS

Water in Vacuum.....	98°	Refined Petroleum.....	316°
Water, Atmospheric Pressure.....	212°	Turpentine.....	315°
Alcohol.....	173°	Sulphur.....	570°
Sulphuric Acid.....	240°	Linseed Oil.....	597°

### MELTING POINTS OF DIFFERENT METALS

Aluminium.....	1400°	Iron (cast).....	2450°
Antimony.....	810°	Iron (wrought).....	2912°
Bismuth.....	476°	Lead.....	608°
Brass.....	1900°	Platinum.....	3080°
Bronze.....	1692°	Silver (pure).....	1873°
Copper.....	1996°	Steel.....	2500°
Glass.....	2377°	Tin.....	446°
Gold (pure).....	2590°	Zinc.....	680°

NOTE:—Above information is quoted from standard authorities.

### MISCELLANEOUS WEIGHTS AND INFORMATION

One cubic inch of Cast Iron.....	weighs	0.26	pounds
One cubic inch of Wrought Iron.....	weighs	0.28	pounds
One U.S. Gallon at 231 cubic inches of water at 62°.....	weighs	8.3356	pounds
One Imp. Gal. at 277.274 cub. inches of water at 62°.....	weighs	10.	pounds
One cubic inch of water.....	weighs	0.36	pounds
One cubic foot of water.....	equals	7.48	U.S. gallons
One cubic foot of water.....	equals	6.23	Imp. gallons
One pound of steam.....	equals	27.222	cubic feet
One pound of air.....	equals	13.817	cubic feet

### WEIGHT OF ONE CUBIC FOOT OF PURE WATER

1 cubic foot of water at 32° (Freezing Point) weighs.....	62.418	pounds
1 cubic foot of water at 39.1° (Maximum density) weighs.....	62.425	pounds
1 cubic foot of water at 62° (Standard temperature) weighs.....	62.355	pounds
1 cubic foot of water at 212° (boiling point) at 1 atmosphere weighs.....	59.76	pounds

### TO CALCULATE INTEREST (2% TO 10%)

Multiply the principal by the number of days and divide as follows:—

Per cent.	Divide by	Per cent.	Divide by
2 per cent	180	6 per cent	60
2½ per cent	144	7 per cent	52
3 per cent	120	8 per cent	45
4 per cent	90	9 per cent	40
5 per cent	72	10 per cent	36

# USEFUL INFORMATION—Continued

## TABLE OF WEIGHTS, LENGTHS AND MEASURES

### LONG MEASURE

12 Inches	=	1 Foot
3 Feet	=	1 Yard
5 1/2 Yards	=	1 Rod
40 Rods	=	1 Furlong
8 Furlongs	=	1 Statute Mile
3 Miles	=	1 League <sup>o</sup>

### SQUARE MEASURE

144 sq. inches	=	1 sq. foot
9 sq. feet	=	1 sq. yard
30 1/4 sq. yards	=	1 sq. rod
40 sq. rods	=	1 rood
4 roods	=	1 acre
640 acres	=	1 sq. mile

### SURVEYOR'S MEASURE

7.92 Inches	=	1 Link
25 Links	=	1 Rod
4 Rods	=	1 Chain
100 Links	=	1 Chain
66 Feet	=	1 Chain
80 Chains	=	1 Mile

### SURVEYOR'S SQUARE MEASURE

625 Square links	=	1 Square rod
16 Square rods	=	1 Square chain
10 Square chains	=	1 Acre
or		
160 Square rods	=	1 Acre
640 Acres	=	1 Square mile
36 Square miles	=	1 Township
6 Miles square	=	1 Township

An acre has roughly 4 equal sides of 69 1/2 yards each.

A square half acre has sides of about 147 ft.

A Square quarter acre has sides of about 104 ft.

### CUBIC MEASURE

1728 Cubic Inches	=	1 Cubic Foot
27 Cubic Feet	=	1 Cubic Yard
2150.42 Cu. Inches	=	1 Stand. Bush.
231 Cubic Inches	=	1 U.S. Gallon
277.274 Cu. Inches	=	1 Imp. Gallon
1 Cubic Foot	=	about 1/4 bush.
128 Cubic feet	=	1 Cord (wood)
40 Cubic feet	=	1 ton (ship'ng)

### LIQUID MEASURE

4 gills	make	1 pint.
2 pints	make	1 quart.
4 quarts	make	1 gallon.
31 1/2 gallons	make	1 barrel
2 barrels	make	1 hogshead.

### DRY MEASURE

2 Pints	=	1 Quart
8 Quarts	=	1 Peck
4 Pecks	=	1 Bushel
36 Bushels	=	1 Chaldron

### AVOIRDUPOIS WEIGHT

437.5 Grains	=	1 ounce
16 Ounces	=	1 Pound
100 Pounds	=	1 Cwt.
2000 Pounds	=	1 Ton

### LONG TON WEIGHT

16 ounces	=	1 Pound
112 Pounds	=	1 cwt.
2240 Pounds	=	1 Ton

### TROY WEIGHT

24 Grains	=	1 Pennyweight
20 Pennyweight	=	1 Ounce
12 Ounces	=	1 Pound
used for weighing Gold, Silver and Jewels.		

### APOTHECARY'S WEIGHT

20 Grains	=	1 scruple
3 Scruples	=	1 dram
8 Drams	=	1 ounce
12 Ounces	=	1 pound

### MEASURE OF ANGLES OR ARCS

60 Seconds (")	=	1 minute
60 Minutes	=	1 Degree <sup>o</sup>
90 Degrees	=	1 Rt. Angle or Quadrant
360 Degrees	=	1 circle

### CLOTH MEASURE

2 1/2 Inches	=	1 nail
4 Nails	=	1 Quarter
4 Quarters	=	1 Yard

## USEFUL INFORMATION—Continued

### TABLE OF WEIGHTS, LENGTHS AND MEASURES

Lengths and Weights and their approximate  
equivalents in the Metric System

LENGTH		LENGTH	
1 Meter	= 39.37 inches	16 Feet	= 4.877 meters
1 Meter	= 3.3 feet	20 Feet	= 6.096 meters
1 Inch	= 2.54 centimeters	24 Feet	= 7.315 meters
1 Foot (12 ins.)	= 30.48 centimeters	30 Feet	= 9.144 meters
2 Inches	= 5 centimeters	72 Feet	= 21.9456 meters
4 Inches	= 10 centimeters	WEIGHTS	
8 Inches	= 20 centimeters		
12 Inches (1 foot)	= 30.48 centimeters	1 Pound or 453.592 Grains	= 0.4536 kilograms
16 Inches	= 40 centimeters	1 Grain	= 0.03527 ounce
20 Inches	= 50 centimeters	100 Pounds	= 45.36 kilograms
4 Feet	= 1.22 meters	1 Kilogram	= 2.2046 pounds
8 Feet	= 2.438 meters	25 Pounds	= 11.34 kilograms
12 Feet	= 3.658 meters	100 Pounds	= 45.36 kilograms

NOTE:—Above information is quoted from standard authorities.

#### MISCELLANEOUS

20 articles	=	1 score
24 sheets	=	1 quire
20 quires	=	1 ream

#### MEASURE OF CAPACITY

Imperial Gallons	U.S. Gallons	Cubic Feet	Cubic Inches	Litres
1	1.2003	.1605	277.27	4.543
.833	1.	.1337	231.	3.785
6.23	7.48	1.	1728.	28.31
.0036	.0043	.00058	1.	.0164
.2201	.2642	.0353	61.03	1.

U.S. Gallons Multiplied by 0.83 equals Imp. Gallons.

Imp. Gallons Multiplied by 1.20 equals U.S. Gallons.

#### LEGAL WEIGHTS OF PRODUCE IN CANADA

Lbs. per Bush.	Lbs. per Bush.	Lbs. per Bush.
Wheat . . . . . 60	Peas . . . . . 60	Clover Seed . . . . . 60
Corn in Ear . . . . . 70	White Beans . . . . . 60	Flax Seed . . . . . 56
Corn shelled . . . . . 56	Castor Beans . . . . . 40	Millet Seed . . . . . 50
Rye . . . . . 56	Irish Potatoes . . . . . 60	Hungarian Grass . . . . . 50
Buckwheat . . . . . 48	Onions . . . . . 50	Timothy Seed . . . . . 48
Barley . . . . . 48	Turnips . . . . . 60	Bluegrass Seed . . . . . 14
Oats . . . . . 34	Beets . . . . . 60	Hemp Seed . . . . . 44
	Carrots and Parsnips . 60	

# TELEGRAPH CODE

## BOILERS

NEW KING ROUND STEAM BOILERS			ROYAL ROUND WATER BOILERS		
Size	High Base	Low Base	Size	High Base	Low Base
4-19-S	Bewail	Bewaiting	4-19-W	Babbling	Bandore
5-19-S	Rewitch	Bewitching	5-19-W	Bachur	Bandful
4-22-S	Bigamy	Bigamist	4-22-W	Bahama	Banjo
5-22-S	Bigoted	Bigotry	5-22-W	Bailiff	Bankside
4-25-S	Bishop	Bismuth	4-25-W	Balcony	Bargain
5-25-S	Blanche	Blanket	5-25-W	Baldness	Batable
4-28-S	Blast	Elarney	4-28-W	Ballad	Beacon
5-28-S	Blister	Blissfully	5-28-W	Ballast	Beagle
4-31-S	Blonde	Bloodless	4-31-W	Ballatry	Beamage
5-31-S	Bloomer	Blotch	5-31-W	Ba'my	Beamless
4-34-S	Blouse	Bluffer	4-34-W	Baluster	Bertha
5-34-S	Blush	Bluster	5-34-W	Bandana	Beverage

ROYAL SQUARE SECTIONAL BOILERS				KING ROUND BOILERS		
STEAM		WATER		Size	CODE WORD	
Size	Code Word	Size	Code Word		High Base	Low Base
S-15-4	Bondage	W-15-4	Bombard	1	Baltoon	Balsam
S-15-5	Bonus	W-15-5	Border	2	Bamboo	Bandage
S-15-6	Bosom	W-15-6	Botany	2½	Bandit	Hanquet
S-19-5	Bounce	W-19-5	Brimstone	3	Bantam	Barber
S-19-6	Bouncing	W-19-6	Broach	3½	Barefoot	Baritone
S-19-7	Boundary	W-19-7	Broaching	4	Baron	Baroness
S-25-5	Bowider	W-25-5	Brocade	4½	Baronet	Barracks
S-25-6	Bracelet	W-25-6	Brogan	5	Bashful	Basil
S-25-7	Brandy	W-25-7	Kroil	5½	Bassoon	Bastile
S-25-8	Bravado	W-25-8	Brother	6	Bastinado	Bathing
S-36-5	Breaker	W-36-5	Browbeat	6A	Battalion	Battlement
S-36-6	Breakfast	W-36-6	Brunette	6½	Bayonet	Beach
S-36-7	Breast pin	W-36-7	Brutal	6½A	Beaver	Becalm
S-36-8	Breast plate	W-36-8	Brutalize	7	Bedeck	Bedlam
S-36-9	Breathe	W-36-9	Brute	7½	Befall	Befit
S-48-6	Breathing	W-48-6	Bubble	8	Beggar	Begwile
S-48-7	Brevet	W-48-7	Bubbling	8½	Belfry	Belle
S-48-8	Bribery	W-48-8	Buckram	9	Benedict	Bengal
S-48-9	Bridal	W-48-9	Buckskin	9½	Benumb	Bestir
S-48-10	Brigadier	W-48-10	Buffoon	.....	.....	.....

# TELEGRAPH CODE—Continued

## NEW KING ROUND WATER BOILERS

Size	Code Word	Size	Code Word	Size	Code Word	Size	Code Word
1	Facia	3 1/2	Fair	5 1/2	Fame	6 1/2 A	Fata
1 1/2	Fact	3 1/2 B	Fairy	5 1/2 B	Fancy	6 1/2 A. B	Fawn
2	Fade	4	Fait	6	Farad	7	Faux
2 1/2	Fain	4 1/2	Faith	6 A	Farce	7 1/2	Fast
2 1/2 B.	Faint	4 1/2 B	Fake	6 A. B.	Farm	7 1/2 B.	Fare
3	Fall	5	Faker	6 1/2	Faro	8	Fang
						8 1/2	Fash

## GENERAL

EAR.....	Impossible to obtain Iron in time specified.
east.....	Impossible to make shipment earlier than
eat.....	Pig Iron price now
ecal.....	Radiator prices in U.S. have advanced
eed.....	Boiler prices in U.S. have advanced
eel.....	American Standard Pipe Thread
eint.....	Whitworth Standard Pipe Thread
ell.....	With Nipples and Half Companion Flangers
elly.....	Can ship in one week
elt.....	Can ship in two weeks
emur.....	Can ship in three weeks
ence.....	Will ship in — weeks
end.....	We can ship at once from stock
ern.....	We can ship at once about
etid.....	We do not understand your telegram
iat.....	Three section boiler
ichu.....	Right hand
ico.....	Left hand
ield.....	Shipment going forward by steamer
ier.....	Draft returned investigate and wire
ife.....	We have made draft for
ight.....	Trace shipment
ilch.....	We have no patterns for
ile.....	We do not manufacture
ilm.....	May we substitute
inal.....	Have you in stock
inch.....	Cannot accept order at prices mentioned
ind.....	Best price at which we can accept order
ire.....	We have not sufficient orders for minimum car-load
irm.....	Can you send us additional orders to make
ish.....	Shall we ship less car-load
ist.....	Prices for immediate acceptance only

# TELEGRAPH CODE—Continued

## BOILERS—Continued

ROYAL SMOKELESS BOILERS				ROYAL FIRE-BOX BOILERS		
STEAM		WATER		STEAM		WATER
Size	Code Word	Size	Code Word	Size	Code Word	Code Word
S-249	Cabbage	W-249	Canella	1	Chambray	Cohesion
S-250	Cabbin	W-250	Cannabis	2	Chanting	Coinage
S-251	Cactus	W-251	Cannipers	3	Charmer	Collardo
S-338	Caddish	W-238	Canticle	4	Cherish	Colonge
S-339	Cadlock	W-239	Carbine	5	Cherubim	Combine
S-340	Cafenet	W-340	Cardigan	6	Chinar	Command
S-341	Caftan	W-341	Cardimina	7	Ciderage	Condole
S-342	Calamar	W-342	Carding	8	Cilician	Confide
S-343	Calumnus	W-343	Carmot	9	Citadel	Conflict
S-344	Calando	W-344	Carnival	10	Clarinet	Congener
S-345	Caicine	W-345	Caromel	11	Clarion	Coniger
S-346	Calcium	W-346	Cartoon	12	Clement	Conquer
S-347	Calfskin	W-347	Cascade	13	Clifton	Contest
S-409	Calico	W-409	Casket	14	Clinker	Corindou
S-410	Camajon	W-410	Cassock	15	Clinure	Cornage
S-411	Camaly	W-411	Castle	16	Cluster	Cornish
S-412	Cambist	W-412	Catalan	17	Coasmings	Crafts
S-413	Camellia	W-413	Category	18	Codger	Crambo
S-414	Cameo	W-414	Cateran	19	Coffer	Cremona
S-550	Camera	W-550	Cavalry	20	Cognac	Crimson
S-551	Camisade	W-551	Cedarn	ROYAL WATER HEATERS		
S-552	Cammoek	W-552	Cenatory	10	Crinkle	
S-553	Campaign	W-553	Centrode	12	Crudle	
S-554	Campus	W-554	Cessant	112	Cumber	
S-555	Canard	W-555	Chafing	15	Cuning	
S-556	Candent	W-556	Chagrin	115	Curable	
S-557	Candid	W-557	Chalice	LAUNDRY HEATER		
S-558	Candock	W-558	Chamade	1	Curfew	
Twin Headers				Calabash		
Triple Headers				Caldron		
Quadruple Headers				Cadence		

# IMPERIAL RADIATOR COMPANY LIMITED

## TELEGRAPH CODE—Continued

### RADIATORS

### Code Word

Imperial, 1 Col.	Steam, Plain.....	Squad
" 1 "	Water, ".....	Squall
" 2 "	Steam, ".....	Squaw
" 2 "	Water, ".....	Squire
" 2 "	Steam, Ornamental.....	Squib
" 2 "	Water, ".....	Squirm
" 3 "	Steam, Plain.....	Squeeze
" 3 "	Water, ".....	Squat
" 3 "	Steam, Ornamental.....	Squatter
" 3 "	Water, ".....	Squadron
" 2 "	Steam, Plain Hospital.....	Squaller
" 2 "	Water, ".....	Square
" 3 "	Steam, ".....	Squareness
" 3 "	Water, ".....	Squash
King, 2 "	Steam, Ornamental.....	Squirrell
" 2 "	Water, ".....	Squander
" 2 "	Steam, Plain.....	Squabber
" 2 "	Water, ".....	Squattish
" 3 "	Steam, Ornamental.....	Stale
" 3 "	Water, ".....	Stable
" 3 "	Steam, Plain.....	Staff
" 3 "	Water, ".....	Stag
" 4 "	Steam, Ornamental.....	Stake
" 4 "	Water, ".....	Stalwart
" 4 "	Steam, Plain.....	Stamp
" 4 "	Water, ".....	Stampede
" 5 "	Steam, Window.....	Staple
" 5 "	Water, ".....	Star
" 9 foot wall,	Ornamental.....	Starch
" 9 "	Plain.....	Startle
" 7 "	Ornamental.....	State
" 7 "	Plain.....	Station
" 6 "	Ornamental.....	Statue
" 6 "	Plain.....	Stay
" 5 "	Ornamental.....	Steadily
" 5 "	Plain.....	Stiff
Direct—Indirect Bases and Dampers.....		Stigma
Climax Indirect Steam.....		Stick
" " Water.....		Stetson
Wall Radiator Brackets.....		Steward
Radiator Nipples 1 1/2 in.....		Stimulant
" " 2 ".....		Stimulus

# TELEGRAPH CODE—Continued

## RADIATOR SECTIONS

	CODE WORD		CODE WORD
2 Sections	Saddle	17 Sections	Sense
3    "	Sailor	18    "	Sentry
4    "	Salad	19    "	Settler
5    "	Salvage	20    "	Shadow
6    "	Sand	21    "	Shellac
7    "	Sapling	22    "	Shot
8    "	Satan	23    "	Slide
9    "	Saunter	24    "	Smoke
10   "	Scandle	25    "	Snob
11   "	Scene	26    "	Snap
12   "	Screw	27    "	Snow
13   "	Scribe	28    "	Solder
14   "	Secret	29    "	Spaniard
15   "	Secure	30    "	Speech
16   "	Seed	.....	.....
Supply Leg Section, 1 Pipe, Steam.....			Sublime
"    "    "    2    "    ".....			Submission
"    "    "    Twin Connection, Water.....			Subscriber
"    "    "    Single    "    ".....			Suburban
Blank Leg Section, Steam.....			Sufferant
"    "    "    Water.....			Suggestion
Return Leg Section, 1 Pipe, Steam.....			Sunbeam
"    "    "    2    "    ".....			Sunburn
"    "    "    Twin Connection, Water.....			Sundown
"    "    "    Single    "    ".....			Sunfish
Centre Leg Section, Steam.....			Superbus
"    "    "    Water.....			Supreme
Centre Section, Steam.....			Surgeon
"    "    Water.....			Surrender

## RADIATOR BUSHINGS

	CODE WORD		CODE USED
Eccentric	Empress	2 x 1 1/2	Enclose
Flush	Empty	2 x 3/4	Emerald
1 1/2 x 1/2	Emulate	2 x 1	Emerge
1 1/2 x 3/4	Enamel	2 x 1 1/4	Eminent
1 1/2 x 1	Encamp	2 x 1 1/2	Empole
1 1/2 x 1 1/4	Enchant	.....	.....



# TELEGRAPH CODE—Continued

## TABLE OF DATES

In Telegraphing dates prefix the day of the month, adding "morn" or "aft" which will signify morning or afternoon of the date given, as per example "Dab-mare-aft" will signify "afternoon of January first," etc.

Date	Code Word	Date	Code Word	Month	Code Word
1st	Dab	17th	Ded	January	Mace
2nd	Dam	18th	Deg	February	Mack
3rd	Dan	19th	Deh	March	Madly
4th	Day	20th	Den	April	Magi
5th	Daf	21st	Deo	May	Mare
6th	Dad	22nd	Dep	June	Maid
7th	Dal	23rd	Deq	July	Mail
8th	Dar	24th	Der	August	Main
9th	Das	25th	Des	September	Make
10th	Dau	26th	Din	October	Man
11th	Daw	27th	Dip	November	Mall
12th	Day	28th	Dis	December	Mark
13th	Daz	29th	Div	.....	.....
14th	Dea	30th	Dit	.....	.....
15th	Deb	31st	Dim	.....	.....
16th	Dec	....	....	.....	.....

Time	Code Word	Time	Code Word
1 Day	Dock	3 Months	Drag
2 Days	Dodge	4 Months	Down
3 Days	Doge	5 Months	Drill
4 Days	Doll	6 Months	Drink
5 Days	Don	Sunday	Dull
6 Days	Dory	Monday	Dope
10 Days	Dose	Tuesday	Dusk
1 Week	Doubt	Wednesday	Dunce
2 Weeks	Draw	Thursday	Duty
3 Weeks	Dray	Friday	Duet
1 Month	Dream	Saturday	Duck
2 Months	Dress	.....	.....

In a day or two.....	Droven
In a few days.....	Drummer
In about a week.....	Downhill
Last of this week or early next.....	Dowel
First of next week.....	Dormant
Not later than.....	Double
Perhaps to-day, at latest, to morrow.....	Dolphin

## TELEGRAPH CODE—Continued

In forming a cipher message the following must be observed.

1. Every Code Word must begin with a capital letter.
2. When a blank space occurs in a sentence of the code, the word to fill in the space must follow the code word; and if more than one blank space occurs the fill-in words must follow in their order after the cipher word.

### ORDERS AND SHIPMENTS

<b>Abaft</b> .....	Ship immediately.
<b>Abandon</b> .....	Ship by express.
<b>Abase</b> .....	Ship by express prepaid.
<b>Abash</b> .....	Ship by freight.
<b>Abate</b> .....	Ship by best route.
<b>Abbe</b> .....	Ship by boat.
<b>Abbot</b> .....	Ship immediately our order No.....
<b>Abbreviate</b> .....	Ship with draft and bill of lading attached.
<b>Abdicant</b> .....	Ship in first car to.
<b>Abdomen</b> .....	Amended shipping instructions.
<b>Abduce</b> .....	Send us bill of lading covering car.
<b>Abuse</b> .....	Ship by lake and rail.
<b>Aborn</b> .....	Ship to-day sure.
<b>Abeam</b> .....	Wire waybill reference and car number our shipment.
<b>Abeaming</b> .....	Shipment—not yet received. Trace and advise record.
<b>Abducing</b> .....	Shipment—received, part short. Trace shortage and advise.
<b>Akin</b> .....	Shipping to-day sure.
<b>Affix</b> .....	Shipped to-day.
<b>Affect</b> .....	Less car load.
<b>Abcess</b> .....	Car load.
<b>Abdom</b> .....	Wire if satisfactory.
<b>Abum</b> .....	Your order No.—specifies.
<b>Abush</b> .....	Your requisition No.—specifies.
<b>Abet</b> .....	Enter order as per our inquiry of.
<b>Abhor</b> .....	Enter order at your quotation of.
<b>Abide</b> .....	Include in car now in preparation.
<b>Abjure</b> .....	Ship by same route as our order No.....
<b>Able</b> .....	Correction Notices.
<b>Abode</b> .....	Will send shipping instructions by mail.
<b>Abominate</b> .....	Shipping instructions for order (No. or date) are
<b>Abound</b> .....	Ship what you can at once.
<b>Abrupt</b> .....	Can't ship as ordered, but could ship to-day.
<b>Abscond</b> .....	Do not hold for others but rush quickly.
<b>Absinthe</b> .....	Send us small lot unless car going at once.
<b>Absorb</b> .....	When can you make shipment.

## TELEGRAPH CODE—Continued

### ORDERS AND SHIPMENTS—Continued

Abstain	Can you ship immediately.
Abstract	When will order (No. or date) be shipped.
Absurd	When and by what route did you ship our order.
Academic	Add to our order (No. or date).
Accept	Duplicate our order (No. or date).
Access	You may substitute on our order (No. or date).
Accrue	Omit from our order (No. or date).
Ace	Hold for instructions order (No. or date).
Ache	Could ship immediately.
Acid	Expect to make shipment.
Acme	Your order (No. or date) was shipped.
Aconite	If not in stock wire.
Acorn	Order No.—is ready for shipment. We have no car going for—days. Shall we forward as small lot? If so, wire shipping instructions.
Acrobat	Order No.—has not yet been shipped.
Acre	See amended shipping instructions.
Acrimony	Referring to your amended shipping instructions.
Action	Can ship complete your No.—immediately except. Shall we make such shipment?
Actuary	Make proposed shipment order No.—without waiting for—.
Adage	Wire at once routing our material covered by
Adament	When will you ship car containing our order?
Adapt	See our correction notice.
Add	Referring to your correction notice.
Addict	Your order (No. or date) does not specify.
Addle	Change our order (No. or date) to read
Address	Referring to your order (No. or date).
Adduce	Referring to our order (No. or date).
Adhere	Do not find any order from you (No. or date).

### QUOTATIONS AND CORRESPONDENCE

Adhesive	At what price and how soon can you furnish.
Adieu	Quote best price on.
Adjacent	In market for.
Adjoin	Quote best price on—square feet of standard (38-inch) height of Radiators.
Adjust	Wire reply quickly.
Admire	Will wire you to-morrow morning.
Admit	Have written.
Almond	Must have information immediately.

# TELEGRAPH CODE—Continued

## QUOTATIONS AND CORRESPONDENCE—Continued

Along	Answer by first mail.
Alter	See our letter of—giving full particulars.
Alto	Have received no reply from you to our letter.
Alumina	Referring to your telegram of.
Amateur	Referring to your letter of.
Amaze	Have received no reply to our telegram of.
Amber	Referring to our letter of.
Ambition	Referring to telephone conversation of to-day.
Ambush	Do not understand meaning of.
Ample	Inclosure mentioned in your letter of—not received. Mail same at once.
Amuse	We quote you for immediate acceptance.
Anchor	Wire carload freight rate on.
Ancient	Answering your wire of date the carload rate per cwt. and minimum weight on.
Annex	Change my route to read as follows.
Annul	Will be here until.
Antic	Will be in.

## FINANCIAL

Adopt	Ship nothing more until account reduced.
Adore	Investigate credit of.
Adulation	Have investigated credit and think people safe.
Advance	Reference furnished not satisfactory.
Advent	Holding order for better credit reference.
Advert	Cannot ship until you collect present account.
Advertise	Have you received settlement from.
Advice	How much does—owe us on unpaid notes?
Advocate	—Has promised settlement on—
Aeronaut	Collect to-day or file lien, advising us fully by mail.
Affair	We cannot wait on—any longer unless you can collect on or before—place with attorney.
Affection	Instruct attorney to file suit in matter of—
Again	We cannot collect account of—owing to.
Agree	We are offered—in settlement of account of—shall we accept it??
Aim	Think it advisable to accept amount offered in settle- ment?
Alibi	Account note settlement—account.
Air	Shall we accept renewal on—note due—
Aisle	May we extend additional credit—dollars to (—)

## TELEGRAPH CODE—Continued

### FINANCIAL—Continued

Alarm.....	Do you recommend accepting notes in settlement— account?
Alive.....	Accept settlement one-half note and one-half cash— account
Alcove.....	Do not accept notes—account. Must have cash settlement in full

### TRANSPORTATION LINES RAILROADS

#### CANADIAN LINES

Rammer.....	Canadian Northern Ontario Rly.
Range.....	Canadian Northern Quebec Rly.
Rake.....	Canadian Pacific Rly.
Rajah.....	Grand Trunk Rly.
Robin.....	Intercolonial Rly.
Rodent.....	Michigan Central Rly.
Romance.....	Niagara St. Catharines & Toronto Rly.
Rosebud.....	Pere Marquette Rly.
Restful.....	Soo Line.
Remnant.....	Temiskaming & Northern Ontario Rly.
Resident.....	Toronto, Hamilton & Buffalo Rly.
Rajole.....	Grand Trunk Pacific Rly.
Robust.....	Halifax & Southwestern Rly.
Ranker.....	Dominion Atlantic Rly.
Relent.....	Reid Newfoundland Rly.
Reformer.....	Dominion Transportation Co.

#### AMERICAN LINES

Rawhide.....	Chicago, Milwaukee & St. Paul Rly.
Rebater.....	Great Northern Rly.
Redcoat.....	North Western Rly.

### NAVIGATION LINES

Redwing.....	Canada Steamship Lines.
Refresher.....	Northern Navigation Co.
Rejoinder.....	Richelieu & Ontario Navigation Co.

### EXPRESS COMPANIES

Relation.....	Canadian
Reluctant.....	Dominion
Ringman.....	All Rail
Roguish.....	All Water
Rustic.....	Lake and Rail
Relearn.....	Canadian Northern

# TELEGRAPH CODE—Continued

NUMBERS							
No.	Code Word	No.	Code Word	No.	Code Word	No.	Code Word
0	Abh	18	Cos	46	Fen	74	KH
00	Abs	19	Clo	47	Fip	75	Km
01	Aer	20	Dra	48	Fon	76	Kip
02	Ack	21	Dre	49	Fom	77	Kit
03	Actu	22	Dru	50	Gar	78	Kio
04	Ada	23	Dru	51	Gau	79	Kna
05	Adm	24	Dro	52	Gen	80	Lah
06	Adv	25	Drs	53	Geo	81	Lan
07	Age	26	Due	54	Gio	82	Lae
08	Agr	27	Dus	55	Gle	83	Lad
09	Aga	28	Dyn	56	Gos	84	Lup
1	Bic	29	Dyo	57	Gra	85	Lus
2	Bin	30	Ecc	58	Gre	86	Luc
3	Bar	31	Edi	59	Gro	87	Lim
4	Bat	32	Ele	60	Haf	88	Lew
5	Bea	33	Elo	61	Hag	89	Lax
6	Bel	34	Elu	62	Han	90	Net
7	Ben	35	Ema	63	Ham	91	Nem
8	Bes	36	Emb	64	Hap	92	Nig
9	Bom	37	Kmd	65	Har	93	Non
10	Car	38	Kmy	66	Haw	94	Nov
11	Cap	39	Kmo	67	Hat	95	Nom
12	Cas	40	Fin	68	Hos	96	Nel
13	Cen	41	Fio	69	Hun	97	Neo
14	Cos	42	Fle	70	Kab	98	New
15	Cha	43	Flo	71	Kar	99	Nie
16	Chi	44	Fos	72	Kan		
17	Cho	45	Fra	73	Kam		

## TO MAKE UP A CODE WORD ABOVE 99

### EXAMPLE:—

525	..	5—Bea	25—Dra	..	"Beads"
1879	..	18—Cis	79—Kna	..	"Ciskna"
10741	..	1—Bic	07—Age	41—Fio	.. "Bicagefio"
100624	..	10—Car	06—Adv	24—Dro	.. "Car advdro"

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